# Journal of the Royal Society of Arts

NO. 4902 FRIDAY, 26TH JUNE, 1953 VOL. CI

## *ANNUAL GENERAL MEETING*

The Council hereby gives notice that, in accordance with the Bye-Laws, the One-hundred-and-ninety-ninth Annual General Meeting, for the purpose of receiving the Council's Report and the Financial Statements for 1952, and for the election of officers, will be held on Wednesday, 1st July, 1953, at 3 p.m., at the Society's House.

(By Order of the Council)

KENNETH WILLIAM LUCKHURST,
*Secretary.*

## *ROYAL DESIGNERS FOR INDUSTRY*

On the recommendation of the Joint Committee of the Royal Society of Arts and the Faculty of Royal Designers for Industry, the Council have made the following new appointments to the distinction of Royal Designer for Industry:

Ernest Race, F.S.I.A. (Furniture).
John W. Waterer, N.R.D., F.S.I.A. (Leather Goods).

Mr. Race's special contribution to furniture design has been in the use of new materials and particularly of metal. He was the runner-up in an international competition for the design of storage units which was sponsored by the Museum of Modern Art, New York, and for which there were 3,000 entries from thirty different countries, and his drawings are now in the permanent collection of that Museum. He designed the standard equipment for the new Lyons' teashops, and much of the furniture for the various displays in connection with the Festival of Britain. He is Director of Design in the firm bearing his name.

Mr. Waterer is a designer and producer of luggage and leather goods, and Managing Director of Messrs. S. Clarke & Co. Ltd. He is author of the recently published *Leather and Craftsmanship*, and also of *Leather: In Life, Art and*

*Industry*. He is a Vice-President of the Design & Industries Association and a member of the Industrial Art Committee of the Federation of British Industries, and is well known for his enthusiastic interest in the promotion of good design.

## *MEETING OF COUNCIL*

A meeting of Council was held on Monday, 8th June, 1953. Present: Mr. E. Munro Runtz (in the Chair); Professor E. N. da C. Andrade; Mr. A. C. Bossom; Sir Frank Brown; Mr. Wells Coates; Sir John Forsdyke; Mr. P. Le Neve Foster; Mr. John Gloag; Sir Ernest Goodale; Mr. A. C. Hartley; Dr. R. W. Holland; Mr. G. K. Menzies; Mr. F. A. Mercer; Mr. J. A. Milne; Mr. O. P. Milne; the Earl of Radnor; Mr. E. M. Rich; Mr. A. R. N. Roberts; Sir Andrew Rowell; Mr. Gordon Russell; Sir Harold Saunders; Sir Selwyn Selwyn-Clarke; Sir John Simonsen; Mr. William Will; Mr. J. G. Wilson, and Miss Anna Zinkeisen; with Mr. K. W. Luckhurst (Secretary).

### PERSONALIA

The congratulations of the Council were expressed to the Chairman, Mr. E. Munro Runtz, on his marriage to Lady Holland, widow of Sir Thomas Holland, a former Chairman of Council, and to Mr. A. C. Bossom, on the Baronetcy conferred upon him in the Coronation Honours.

### ELECTIONS

The following candidates were duly elected Fellows of the Society:

Anders, Donald, St. Helens, Lancs.
Baden-Powell of Gilwell, The Right Honble. the Lord, Dockenfield, Surrey.
Baerlein, Edgar M., B.A., A.M.I.C.E., Chesham, Bucks.
Boldero, Alistair John, Pulborough, Sussex.
Brennesholtz, Louis L., Maplewood, New Jersey, U.S.A.
Cadell, Colonel Henry Moubray, O.B.E., J.P., M.I.Mech.E., Linlithgow, W. Lothian.
Cahn, Sir Albert, Bart., Studley, Warwicks.
Calder, Clifford Howard, West Wickham, Kent.
Calder, Hector William Arnold, Beaumaris, Victoria, Australia.
Cardew, Reginald Geoffrey, London.
Chalker, Major Oliver, Barrow-in-Furness, Lancs.
Che, Lucky, Hong Kong.
Cheung, Yu-Chiu, Hong Kong.
Colton, Miss Gladys Madge, B.A., London.
Ellis, Tony, Salford, Lancs.
Evans, Mrs. Emilie Mary, Doncaster, Yorks.
Ford, Oliver Frederick, Bournemouth, Hants.
Greenfield, Frederick Walter, Colchester, Essex.
Guthrie, Alan Michael, B.Sc., Rondebosch, South Africa.
Hardman, Arthur Ritson, Liverpool, Lancs.
Johnson, William Baxter, Longview, Washington, U.S.A.

Joseph, Vivien, London.
Kalthod, Gurudathrao Ganapathrao, B.Sc., Ph.D., Bombay, India.
Kaushal, Ramprasad, D.Sc., Ph.D., Indore, India.
Keighley, Ernest, Stanmore Common, Middlesex.
Kingdon, Raymond William, Ramsgate, Kent.
Kolbuszewski, J., Ph.D., D.I.C., F.G.S., Birmingham.
Lacey, Captain Frederick Arthur, B.A., Brighton, Sussex.
Latif, Muhammad Abdul, B.A., London.
Lau, Tse Kwan, Hong Kong.
Long, John Mostyn, Harrow, Middlesex.
Lister, William Edward, Golcar, Yorks.
McHaffie, Ivan Roy, D.Sc., Montreal, Canada.
Maxwell, Lieut.-Cmdr. Maxwell Gervaise, R.N.V.R., Sydney, Australia.
Meldrum, William Ronald, London.
Miller, Charles Leslie Simon, Bournemouth, Hants.
Miller, John Erhardt, Hollis, New York, U.S.A.
Norton, Reginald, Doncaster, Yorks.
Powell, Peter Pearce, Toronto, Ontario, Canada.
Redmond, Thomas Patrick, Bromley, Kent.
Shum, Ping-Nam, Hong Kong.
Smart, Leslie Ernest, Hambrook, Sussex.
Smith, Philip Chabut, Verona, New Jersey, U.S.A.
Sohn, Frank, Toledo, Ohio, U.S.A.
Trethewey, Professor William Hilliard, M.A., Ph.D., Toronto, Ontario, Canada.
White, Geoffrey Ian, B.A., Beckenham, Kent.
Williams, Raymond Henry, London.
Withers, Miss Elizabeth Audrey, O.B.E., London.
Wu, Mrs. Daisy, Hong Kong.
Young, John Stuart, Uplawmoor, Renfrewshire.

The following school was admitted under Bye-Law 66:

The County High School for Boys, Leyton.

### FUND FOR THE PRESERVATION OF ANCIENT COTTAGES

It was decided to expend the balance in the Fund for the Preservation of Ancient Cottages upon the repair of a group of cottages at Chiddingstone, Kent.

### SWINEY PRIZE

It was agreed to invite Professor R. Y. Gooden, R.D.I., to design the cup to be awarded as part of the Swiney Prize in January, 1954.

### EXAMINATIONS

Reported that the entries for the summer series of examinations totalled 64,642, as compared with 56,579 in 1952.

### OTHER BUSINESS

A quantity of financial and other business was transacted.

# FINANCIAL STATEMENTS FOR 1952.

The following statements are published in accordance with Section 25 of the Society's Bye-laws

## BALANCE SHEET, 31st December, 1952.

| *1951* £ | | £ | £ |
|---|---|---|---|
| | **General Fund Accounts**— | | |
| *88,178* | General Purposes Capital Account per annexed account (page 546) ... ... ... ... ... ... ... | 88,638 | |
| *6,423* | Dr. Cantor's Bequest ... ... ... ... ... | 6,423 | |
| *2,500* | Lord Bennett's Bequest ... ... ... ... ... | 2,602 | |
| *8,204* | Henry Morley's Bequest ... ... ... ... ... | 8,204 | |
| — | Dorothy Corfield's Bequest ... ... ... ... | 1,549 | |
| | Life Composition Account (page 546): | | |
| *9,845* | Unexpired balance of compositions received on the basis of taking credit for such compositions over a period of 12 years from their receipt ... ... | 10,372 | |
| *115,150* | | | 117,788 |
| | **Specific Fund Accounts** (page 546)— | | |
| *10,124* | Amount accumulated towards pensions payable under Modified Superannuation Scheme ... ... ... | 11,417 | |
| *2,542* | Provision for Rehabilitation of Building, including £500 gift in memory of the late Lord Amulree ... | 2,617 | |
| *27* | Industrial Art Bursaries Fund Account ... ... ... | 125 | |
| *12,693* | | | 14,159 |
| | **Liabilities**— | | |
| *6,433* | Creditors ... ... ... ... ... ... ... ... | 5,323 | |
| *109* | Colombo New Cathedral Competition ... ... ... | 109 | |
| *2,048* | Industrial Art Bursaries awarded (but not expended) ... | 2,583 | |
| *567* | Preservation of Ancient Cottages Fund ... ... | 591 | |
| | Uninvested Trust Capital: | | |
| *36* | Cadman Memorial Fund ... ... ... ... | 71 | |
| — | Dr. Swiney's Bequest ... ... ... ... | 563 | |
| *1,000* | *Joseph Paxton Memorial Trust* ... ... ... | — | |
| *1,573* | Unexpended Trust Income *less* Income over-expended (page 549) ... ... ... ... ... ... ... ... | 1,766 | |
| *278* | Contributions received for Industrial Art Bursaries to be awarded in 1953 ... ... ... ... ... | 108 | |
| *94* | *Modified Superannuation Scheme* ... ... ... | — | |
| *12,138* | | | 11,054 |
| *139,981* | Carried forward ... ... ... ... ... ... | | 143,001 |

| | £ | £ | *1951* £ |
|---|---|---|---|
| **General and Specific Fund Assets**— | | | |
| Freehold Property, 6/8 John Adam Street | | | |
| Cost in 1922, plus additions, *less* sales and compensation received ... ... ... ... ... | | 49,788 | *49,788* |
| Pictures, Books, Furniture and Fixtures (as fixed in 1919) ... ... ... ... ... ... ... ... | | 10,000 | *10,000* |
| Investments: | | | |
| Freehold Ground Rents, at cost ... ... ... | 5,054 | | *10,092* |
| Securities (page 547) | | | |
| General (Market Value £24,035—1951 £23,738) | 27,345 | | *27,345* |
| Dr. Cantor's Bequest (Market Value £5,361—1951 £5,411) ... ... ... ... ... ... | 6,356 | | *6,356* |
| Lord Bennett's Bequest (Market Value £2,380—1951 £2,255) ... ... ... ... ... | 2,602 | | *2,500* |
| Henry Morley's Bequest (Market Value £6,762—1951 £6,924) ... ... ... ... ... | 8,204 | | *8,204* |
| Dorothy Corfield's Bequest (Market Value £922) ... ... ... ... ... ... | 889 | | — |
| Held towards meeting pensions payable under Modified Superannuation Scheme (Market Value £9,584—1951 £8,010) ... ... | 10,079 | | *8,299* |
| Fund for Rehabilitation of Building (Market Value £2,150—1951 £2,181) ... ... | 2,500 | | *2,500* |
| | | 63,029 | *65,296* |
| | | 122,817 | *125,084* |
| Stocks of Stationery and Working Papers of Examinations Department at value estimated by the Society's printer ... ... ... ... ... ... ... | 3,941 | | *3,449* |
| Debtors and Payments in Advance ... ... ... | 3,517 | | *4,854* |
| Balances with Bankers and Cash in Hand ... ... | 12,726 | | *6,594* |
| | | 20,184 | *14,897* |
| Carried forward | | 143,001 | *139,981* |

| 1951 | | | | | |
|---|---|---|---|---|---|
| £ | | £ | £ | | |
| 12,158 | | | 11,054 | | |
| 139,981 | Carried forward ... ... ... ... ... ... | | 143,001 | Carried forward | 20,184 14,897 |
| | | | | | 143,001 139,981 |

## BALANCE SHEET, 31st December, 1952—*continued.*

| 1951 | | | | | | | 1951 |
|---|---|---|---|---|---|---|---|
| £ | | £ | £ | | £ | £ | £ |
| 139,981 | Brought forward ... ... ... ... ... | | 143,001 | Brought forward ... ... ... ... ... ... | | 143,001 | 139,981 |
| | **Trust Fund Accounts—** | | | **Trust Fund Assets—** | | | |
| 23,957 | Capital Account : Balance at 31st December, 1951 ... | 25,236 | | Capital : Investments (pages 547–8) : | | | |
| | *Add :* Receipts in respect of the Cadman Memorial | | | Freehold Ground Rents, at cost ... | 2,089 | | 4,477 |
| 35 | Fund ... ... ... ... ... ... | 35 | | Securities (Market Value £22,820—1951 £18,682) ... ... ... ... | 24,223 | | 19,723 |
| — | A. C. Bosson Lecture Endowment Fund ... | 500 | | | 26,312 | | 24,200 |
| — | Profit on Sale of Freehold Ground Rents ... | 1,175 | | Uninvested Funds ... ... ... ... | 634 | | 1,036 |
| 1,000 | *Joseph Paxton Memorial Trust* ... ... ... | — | | | 26,946 | | 25,236 |
| 500 | *E. Frankland Armstrong Trust* ... ... ... | — | | Income due from the Society ... ... ... | 1,706 | | 1,573 |
| 25,492 | | 26,946 | | | | | |
| | *Deduct : Francis Cobb Fund transferred to General* | | | | | | |
| 256 | *Purposes Capital Account* ... ... ... | — | | | | | |
| 25,236 | | 26,946 | | | | | |
| 1,573 | Unexpended Income (net) ... ... ... ... | 1,706 | | | | | |
| 26,809 | | | 28,652 | | | 28,652 | 26,809 |
| | **Modified Superannuation Scheme Account—** | | | **Modified Superannuation Scheme Assets—** | | | |
| 1,843 | Balance at 31st December, 1951 ... ... ... | 1,874 | | *Investments at cost (Market Value £1,609)* ... ... | — | | 1,789 |
| 31 | *Add : Interest received* ... ... ... ... ... | — | | *Due from the Society* ... ... ... ... ... | — | | 94 |
| 1,874 | | 1,874 | | | — | — | 1,874 |
| | *Deduct :* Amount reverting to the Society on the retire- | | | | | | |
| — | ment of a member of the Scheme ... ... | 1,874 | | | | | |
| 1,874 | | | — | | | | |

*Note :*

Credit has been taken for the whole of the subscriptions received during the year, although some relate to periods expiring after the date of the Balance Sheet, but no credit has been taken for subscriptions due but unpaid at 31st December, 1952.

On behalf of the Council

E. MUNRO RUNTZ, *Chairman.*

ROBT. W. HOLLAND, H. A. F. LINDSAY } *Treasurers.*

| | | | |
|---|---|---|---|
| £168,664 | £171,653 | £171,653 | £168,664 |

*Report of the Auditors to the Council and Fellows of the Royal Society of Arts.*

*We have obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purposes of our audit. In our opinion proper books of account have been kept by the Society so far as appears from our examination of those books. We have examined the above Balance Sheet and annexed Income and Expenditure Account which are in agreement with the books of account. In our opinion and to the best of our information and according to the explanations given us the Balance Sheet gives a true and fair view of the state of the Society's affairs as at 31st December, 1952, and the Income and Expenditure Account gives a true and fair view of the income and expenditure for the year ended on that date.*

5 London Wall Buildings,
London, E.C.2.
1st *June*, 1953.

DELOITTE, PLENDER, GRIFFITHS & CO., *Auditors.*
*Chartered Accountants.*

# INCOME AND EXPENDITURE ACCOUNT

## for the Year ended 31st December, 1952.

### EXPENDITURE

| 1951 | | £ | £ |
|---|---|---|---|
| | Printing and Publishing *Journal*— | | |
| 6,166 | Printing and Paper | 6,014 | |
| 936 | Postages | 961 | |
| 269 | Reviews, Shorthand Reports and other expenses | 277 | |
| 7,371 | | | 7,252 |
| 1,484 | Library—Salaries, Books, etc. | | 1,221 |
| 147 | Cost of Albert and Society's Medals *and R.D.I. Expenses* | | 98 |
| | Industrial Art Bursaries— | | |
| 200 | Contribution to Fund | 200 | |
| 262 | Expenses of Competition | 198 | |
| 462 | | | 398 |
| 207 | Cantor and Morley Lectures | | 195 |
| | Examination Expenses— | | |
| 9,298 | Examiners' Fees | 8,822 | |
| 5,738 | Stationery and Printing | 8,155 | |
| 5,624 | Other Expenses | 5,106 | |
| 12,056 | Proportion of Salaries as below | 11,804 | |
| 513 | Proportion of House and Office Expenses as below | 338 | |
| 33,229 | | | 34,225 |
| 42,900 | Carried forward | | 43,389 |

### INCOME

| 1951 | | £ | £ | £ |
|---|---|---|---|---|
| 14,429 | Annual Subscriptions received during year | | 15,187 | |
| — | Registration Fees | | 233 | |
| 1,422 | One-twelfth of Life Compositions received during twelve years to date | | 1,531 | |
| 10 | *Donation* | | — | |
| | Income from— | | | |
| 370 | Ground Rents | 280 | | |
| 907 | General Fund Investments | 840 | | |
| 200 | Dr. Cantor's Bequest | 200 | | |
| 73 | Lord Bennett's Bequest | 73 | | |
| 257 | Henry Morley's Bequest | 261 | | |
| — | Dorothy Corfield's Bequest | 2 | | |
| 261 | Trust Funds for General Purposes | 271 | | |
| 72 | Bank Accounts | 67 | | |
| 2,140 | | | 1,994 | |
| 809 | Sales of *Journal*, etc. | 924 | | |
| 2,497 | Advertisements in *Journal* | 2,222 | | |
| 3,306 | | | 3,146 | |
| 31,699 | Examination Fees | 29,302 | | |
| 1,569 | Sales of Examination Papers and Advertisements | 2,038 | | |
| 33,268 | | | 31,340 | |
| [illegible] | Rents Receivable | | [illegible] | |
| 54,940 | Carried forward | | 53,706 | |

| 1951 | | £ | £ |
|---|---|---|---|
| £ | | | |
| 42,900 | Brought forward ... ... ... ... ... ... | | 43,389 |
| 19,710 | Salaries, Wages and Superannuation Scheme ... ... | 19,897 | |
| 12,056 | *Less :* Proportion estimated to be applicable to Examinations above ... ... ... ... | 11,804 | |
| 7,654 | | | 8,093 |
| | House and Office Expenses— | | |
| 739 | Rates and Insurance ... ... ... ... | 779 | |
| 132 | Repairs, Renewals and Decorations... ... ... | 77 | |
| 1,118 | Lighting, Heating, Cleaning, Expenses of Meetings and General Charges ... ... ... ... | 603 | |
| 3,141 | Stationery, Printing, Postages, Telephone, Audit and Accountancy and other Office Expenses ... | 1,921 | |
| 5,130 | | 3,380 | |
| 513 | *Less :* Proportion (10 per cent.) allocated to Examinations above ... ... ... | 338 | |
| 4,617 | | | 3,042 |
| 1,466 | Pensions and Honorarium ... ... ... ... | 2,241 | |
| 669 | *Less :* Charged against Modified Superannuation Scheme Fund Account ... ... ... | 932 | |
| 797 | | | 1,309 |
| 8,517 | *Exhibition of Exhibitions and 1951 Celebrations (net)* ... | | — |
| £64,785 | | | £55,833 |

| | | £ | 1951 £ |
|---|---|---|---|
| 53,766 | 54,940 | Brought forward ... ... ... ... ... ... | |
| 2,067 | 9,875 | Excess of Expenditure over Income carried to General Purposes Capital Account ... ... ... ... | |
| £55,833 | £64,785 | | |

# GENERAL PURPOSES CAPITAL ACCOUNT

## for the Year ended 31st December, 1952.

| 1951 | | | | 1951 |
|---|---|---|---|---|
| £ | | £ | £ | £ |
| 9,875 | Excess of Expenditure over Income per foregoing account ... ... | 2,067 | Balance at 31st December, 1951 ... | 88,178 |
| 88,178 | Balance per Balance Sheet ... ... | 88,638 | Profit on Sale of Freehold Ground Rents ... ... ... ... | 1,825 |
| | (N.B.—Provision has not been made for War Damage Repairs still outstanding nor credit taken for further amounts recoverable from the War Damage Commission.) | | Mrs. Rosa de Saubergue's Bequest ... | 686 |
| | | | Grant from the Estate of the late Sir George Sutton ... ... ... | 16 |
| | | | *Profit on Sale of Leasehold Property...* | — |
| | | | *Profit on Sale of Shares ... ...* | — |
| | | | *Francis Cobb Fund transferred from Trust Funds ... ... ...* | — |
| £98,053 | | £90,705 | | £90,705 |

# LIFE COMPOSITION ACCOUNT for the Year ended 31st December, 1952.

| 1951 | | | | 1951 |
|---|---|---|---|---|
| £ | | £ | £ | £ |
| | Amount taken into the Society's Income— | | Balance at 31st December, 1951 ... | 9,845 |
| | One-twelfth of Compositions received during twelve years to | | Compositions received during year ... | 2,058 |
| 1,422 | date ... ... ... ... | 1,531 | | |
| 9,845 | Balance per Balance Sheet ... ... | 10 372 | | |
| £11,267 | | £11,903 | | £11,903 |

# SPECIFIC FUND ACCOUNTS for the Year ended 31st December, 1952.

| 1951 | | | | 1951 |
|---|---|---|---|---|
| | **Amount accumulated towards pensions payable under Modified Superannuation Scheme—** | | | |
| £ | | £ | £ | £ |
| 10,499 | Balance at 31st December, 1951 ... | 10,124 | | |
| 294 | *Add :* Interest on Investments ... | 351 | | |
| | Amount reverting to the Society on the retirement of a member of the Scheme | 1,874 | | |
| 10,793 | | 12,349 | | |
| 669 | *Deduct :* Proportion of Pensions paid during year ... | 932 | | |
| £10,124 | | £11,417 | | |
| | **Provision for Rehabilitation of Building—** | | | |
| £ | | £ | | |
| 2,467 | Balance at 31st December, 1951 ... | 2,542 | | |
| 75 | *Add :* Interest on Investment ... | 75 | | |
| £2,542 | | £2,617 | | |

| | | | | |
|---|---|---|---|---|
| **Industrial Art Bursaries Fund Account—** | | | | |
| | | £ | £ | £ |
| Balance at 31st December, 1951 ... | | | 27 | 71 |
| *Add :* Contributions received ... | | | 1,973 | 1,506 |
| Appropriation from Art Congress Studentship ... | | | 150 | — |
| | | | 2,150 | 1,577 |
| *Deduct :* Bursaries awarded for 1952 ... ... | | £2,225 | | 1,750 |
| Cost of pamphlets and other Expenses | | 198 | | 262 |
| | | 2,423 | | 2,012 |
| *Less :* charged against Income and Expenditure Account | | 398 | | 462 |
| | | | 2,025 | 1,550 |
| | | | £125 | £27 |

# INVESTMENTS.

## 31st December, 1952.

| | | Book Value |
|---|---|---|
| **SOCIETY** | | £ |
| £5,856 | 3 per cent. Savings Bonds 1955/65 | 5,856 |
| £9,840 | 3 per cent. Savings Bonds 1960/70 | 9,840 |
| £1,593 | 3 per cent. Savings Bonds 1965/75 | 1,593 |
| £500 | 3 per cent. War Stock 1955/59 | 500 |
| £433 | 3½ per cent. War Stock 1952 or after | 580 |
| £500 | 2½ per cent. Defence Bonds (Conversion issue) | 500 |
| £500 | Commonwealth of Australia 4 per cent. Registered Stock 1955/70 | 445 |
| £555 | Commonwealth of Australia 3 per cent. Registered Stock 1955/58 | 538 |
| £100 | Commonwealth of Australia 3 per cent. Registered Stock 1964/66 | 102 |
| £2,057 | Birmingham Corporation 3½ per cent. Redeemable Stock 1957/62 | 2,020 |
| £971 | London County 3½ per cent. Consolidated Stock 1952/62 | 1,030 |
| £1,156 | Metropolitan Water Board 3 per cent. "B" Stock 1934/2003 | 1,000 |
| £3,110 | British Transport 3 per cent. Stock 1978/88 | 3,110 |
| £24 | New River Co., Ltd. Stock | 6 |
| £269 | 3½ per cent. Conversion Loan 1961 or after | 255 |
| | | £27,345 |

| | | Cost |
|---|---|---|
| **DR. CANTOR'S BEQUEST** | | |
| £2,973 | 3 per cent. Savings Bonds 1955/65 | £2,973 |
| £688 | 3 per cent. Savings Bonds 1960/70 | 688 |
| £2,562 | 3½ per cent. War Stock 1952 or after | 2,695 |
| | | £6,356 |

| | | Cost |
|---|---|---|
| **LORD BENNETT'S BEQUEST** | | |
| £2,559 | 3 per cent. Savings Bonds 1955/65 | £2,602 |

| | | Cost or value when received |
|---|---|---|
| **HENRY MORLEY'S BEQUEST** | | |
| £750 | 2½ per cent. Defence Bonds | £751 |
| £182 | 3 per cent. Savings Bonds 1955/65 | 187 |
| £1,110 | 3½ per cent. Conversion Stock | 1,182 |
| £2,004 | British Transport 3 per cent. Stock 1978/88 | 2,604 |
| £1,486 | Treasury 3 per cent. Stock 1966 or after | 1,487 |
| £2,656 | East Africa High Commission 3½ per cent. Stock 1966/68 | 2,595 |
| | | £8,204 |

| | | Value when received |
|---|---|---|
| **DOROTHY CORFIELD'S BEQUEST** | | |
| £325 | 3 per cent. Savings Bonds 1955/65 | £291 |
| £200 | United Railways of the Havana and Regla Warehouses, Ltd. Ordinary Stock | 3 |
| £100 | Corporation of Manchester 4 per cent. Consolidated Stock | 86 |
| £100 | 4 per cent. Funding Stock 1960/90 | 96 |
| £275 | Anglo-Iranian Oil Company Limited 9 per cent. Cumulative Second Preference Stock | 413 |
| | | £889 |

| | | Cost |
|---|---|---|
| **MODIFIED SUPERANNUATION SCHEME** | | |
| £4,709 | 4 per cent. Funding Stock 1960/90 | £4,709 |
| £1,536 | 3 per cent. Funding Stock 1959/69 | 1,529 |
| £1,896 | 3 per cent. National Defence Stock 1954/58 | 1,841 |
| £2,000 | 3 per cent. Savings Bonds 1960/70 | 2,000 |
| | | £10,079 |

| | | Cost |
|---|---|---|
| **FUND FOR REHABILITATION OF BUILDING** | | |
| £2,500 | 3 per cent. Savings Bonds 1960/70 | £2,500 |

| | | | Cost or value when received in trust |
|---|---|---|---|
| **TRUST FUNDS** | | | |
| Dr. Aldred Trust. | | | |
| £154 | 3½ per cent. War Stock 1952 or after | | £211 |
| Art Congress Studentship. | | | |
| £1,000 | 3 per cent. Defence Bonds (issued Dec. 29th, 1945) | £1,000 | |
| £121 | 3 per cent. Savings Bonds 1960/70 | 121 | |
| £391 | 3½ per cent. War Stock 1952 or after | 399 | |
| | | | 1,520 |
| R. B. Bennett Empire Prize Trust. | | | |
| £1,500 | 3 per cent. Savings Bonds 1960/70 | | 1,500 |
| Sir George Birdwood Memorial Fund. | | | |
| £735 | 3½ per cent. War Stock 1952 or after | | 674 |
| Selwyn Brinton Trust. | | | |
| £1,000 | 3 per cent. Savings Bonds 1955/65 | | 1,000 |
| Alfred Davies Bequest. | | | |
| £2,039 | 3 per cent. Savings Bonds 1960/70 | | 2,039 |

## INVESTMENTS—*continued*

Le Neve Foster Trust.

| | | | |
|---|---|---|---|
| £140 | 3½ per cent. Conversion Stock 1961 or after ... ... ... ... ... ... ... | £100 | |
| £42 | 3½ per cent. War Stock 1952 or after ... ... ... ... ... ... ... ... | 40 | |
| £200 | Birmingham Corporation 3¼ per cent. Redeemable Stock 1957/62 ... ... ... ... | 200 | |
| | | | 340 |
| John Fothergill Trust. | | | |
| £272 | 3½ per cent. War Stock 1952 or after ... ... ... ... ... ... ... ... | | 374 |
| Thomas Gray Memorial Trust. | | | |
| £9,048 | 3½ per cent. Conversion Stock 1961 or after ... ... ... ... ... ... ... | | 7,500 |
| Howard Trust. | | | |
| £511 | British Transport 3 per cent. Stock 1978/88 ... ... ... ... ... ... ... | | 511 |
| Owen Jones Memorial Trust. | | | |
| £474 | 3 per cent. Savings Bonds 1955/65 ... ... ... ... ... ... ... ... | | 474 |
| Neil Matheson McWharrie Trust. | | | |
| £350 | 3 per cent. Savings Bonds 1965/75 ... ... ... ... ... ... ... ... | | 350 |
| Dr. Mann Trust. | | | |
| £1,028 | 3½ per cent. War Stock 1952 or after ... ... ... ... ... ... ... ... | | 900 |
| Mulready Trust. | | | |
| £111 | 3½ per cent. War Stock 1952 or after ... ... ... ... ... ... ... ... | | 110 |
| North London Exhibition Trust. | | | |
| £135 | 3½ per cent. War Stock 1952 or after ... ... ... ... ... ... ... ... | | 185 |
| Sir William J. Pope Memorial Fund. | | | |
| £3 57 | 3 per cent. Savings Bonds 1965/75 ... ... ... ... ... ... ... ... | | 357 |
| Russian Embassy Prize. | | | |
| £100 | 3½ per cent. War Stock 1952 or after ... ... ... ... ... ... ... ... | | 91 |
| Benjamin Shaw Trust. | | | |
| £94 | 3½ per cent. War Stock 1952 or after ... ... ... ... ... ... ... ... | | 129 |
| John Stock Trust. | | | |
| £70 | 3½ per cent. War Stock 1952 or after ... ... ... ... ... ... ... ... | | 100 |
| Dr. Swiney's Bequest. | | | |
| | Freehold Ground Rents ... ... ... ... ... ... ... ... ... | £2,000 | |
| £3,498 | 4 per cent. Consolidated Stock ... ... ... ... ... ... ... ... | 3,000 | |
| | | | 5,000 |
| Trueman Wood Lecture Endowment Fund. | | | |
| £930 | 3½ per cent. Conversion Stock 1961 or after ... ... ... ... ... ... ... | | 655 |
| Cadman Memorial Fund. | | | |
| £285 | 2½ per cent. Defence Bonds ... ... ... ... ... ... ... ... ... | | 285 |
| Thomas Holland Trust. | | | |
| £600 | 2½ per cent. Treasury Stock 1975 or after ... ... ... ... ... ... ... | | 417 |
| E. Frankland Armstrong Trust. | | | |
| £541 | 3 per cent. Savings Bonds 1960/70 ... ... ... ... ... ... ... ... | | 500 |
| Joseph Paxton Memorial Trust. | | | |
| £1,138 | 4 per cent. Consolidated Stock ... ... ... ... ... ... ... ... ... | | 1,000 |
| A. C. Bossom Lecture Endowment Fund. | | | |
| £612 | 2½ per cent. Savings Bonds 1964/67 ... ... ... ... ... ... ... ... | | 500 |
| | | | £26,312 |

# TRUST INCOME AND EXPENDITURE
## for the year ended 31st December, 1952.

| | Unexpended Income 1st Jan. 1952. | Income received during year. | Expenditure on lectures, prizes and adminis-tration. | Amount applied to Society's General Purposes. | Unexpended Income carried forward 31st Dec. 1952. |
|---|---|---|---|---|---|
| | £ | £ | £ | £ | £ |
| Dr. Aldred Trust ... ... ... ... ... | 7 | 6 | — | — | 13 |
| Art Congress Studentship ... ... ... ... | 319 | 47 | 154 | — | 212 |
| R. B. Bennett Empire Prize Trust ... ... | 7 | 45 | — | — | 52 |
| Sir George Birdwood Memorial Fund ... ... | 162 | 25 | 64 | — | 123 |
| Selwyn Brinton Trust ... ... ... ... | 221 | 30 | 32 | — | 219 |
| Alfred Davies Bequest ... ... ... ... | — | 61 | — | 61 | — |
| Le Neve Foster Trust... ... ... ... ... | 7 | 13 | — | — | 20 |
| John Fothergill Trust... ... ... ... ... | 85 | 9 | 15 | — | 79 |
| Thomas Gray Memorial Trust ... ... ... | 226 | 317 | 278 | — | 265 |
| Howard Trust ... ... ... ... ... ... | 124 | 15 | — | — | 139 |
| Owen Jones Memorial Trust ... ... ... | 61 | 14 | — | — | 75 |
| Neil Matheson McWharrie Trust ... ... ... | 16 | 11 | 21 | — | 6 |
| Dr. Mann Trust ... ... ... ... ... | *Dr.* 26 | 36 | 32 | — | *Dr.* 22 |
| Mulready Trust ... ... ... ... ... | 14 | 4 | — | 4 | 14 |
| North London Exhibition Trust ... ... ... | 78 | 5 | — | — | 83 |
| Sir William J. Pope Memorial Fund ... ... | 14 | 11 | — | — | 25 |
| Russian Embassy Prize ... ... ... ... | 57 | 4 | 5 | — | 56 |
| Benjamin Shaw Trust ... ... ... ... | 20 | 3 | — | — | 23 |
| John Stock Trust ... ... ... ... ... | 45 | 2 | — | — | 47 |
| Dr. Swinney's Bequest ... ... ... ... ... | 120 | 246 | — | 206 | 160 |
| Trueman Wood Lecture Endowment Fund ... | *Dr.* 22 | 33 | — | — | 11 |
| Cadman Memorial Fund ... ... ... ... | 15 | 7 | — | — | 22 |
| Thomas Holland Trust ... ... ... ... | 15 | 15 | — | — | 30 |
| E. Frankland Armstrong Trust ... ... ... | 8 | 16 | — | — | 24 |
| Joseph Paxton Memorial Trust ... ... ... | — | 23 | — | — | 23 |
| A. C. Bossom Lecture Endowment Fund ... ... | — | 8 | 1 | — | 7 |
| | 1,621 | £1,006 | £602 | £271 | 1,728 |
| | *Dr.* 48 | | | | *Dr.* 22 |
| | £1,573 | | | | £1,706 |

# PRESERVATION OF ANCIENT COTTAGES FUND. INCOME AND EXPENDITURE ACCOUNT for the year ended 31st December, 1952.

| *1951* | | | | *1951* |
|---|---|---|---|---|
| £ | | £ | | £ |
| *10* | Insurance, etc. ... ... ... ... ... | 10 | Interest on Investments ... ... | *47* |
| *65* | Excess of Income over Expenditure transferred to Capital Account ... | 65 | Rents Receivable ... ... ... | *28* |
| *£75* | | £75 | | *£75* |

# BALANCE SHEET, 31st December, 1952.

| *1951* | | | | *1951* |
|---|---|---|---|---|
| £ | | £ | £ | £ |
| | Capital Account— | | | |
| *3,119* | Balance at 31st December, 1951... ... ... ... | 3,184 | | |
| | *Add:* Excess of Income over Expenditure as above ... ... | 65 | | |
| *65* | | | | |
| *3,184* | | | 3,249 | *1,000* |
| — | Creditor ... ... ... | | 1 | |
| | ROBT. W. HOLLAND, H. A. F. LINDSAY } *Treasurers.* | | | |
| *£3,184* | | | £3,250 | *£3,184* |

| | | £ | *1951* £ |
|---|---|---|---|
| Cottages at Drayton St. Leonard (James Cranstoun Bequest) as fixed in 1932 ... ... ... | | 1,000 | *1,000* |
| £500 3% Savings Bonds, 1955/65 at cost ... ... | £ 500 | | |
| £132 3% Savings Bonds 1960/70 at cost ... ... | 132 | | |
| £556 Agricultural Mortgage Corporation Ltd. 4½% Debenture Stock, 1961/91, (James Cranstoun Bequest) at cost ... ... ... | 541 | | |
| £55 Hampstead Garden Suburb Trust Ltd., 5½% Debenture Stock at par value... ... ... ... | 55 | | |
| | | 1,228 | *1,228* |
| (Market Value £1,177—1951 £1,180) | | | |
| Debtors ... ... ... ... | | 603 | *580* |
| Balance with Bankers ... ... | | 419 | *376* |
| | | £3,250 | *£3,184* |

*Report of the Auditors to the Council and Fellows of the Royal Society of Arts.*

*We have obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purposes of our audit. In our opinion proper books of account have been kept by the Fund so far as appears from our examination of those books. We have examined the above Balance Sheet and Income and Expenditure Account which are in agreement with the books of account. In our opinion and to the best of our information and according to the explanations given us the Balance Sheet gives a true and fair view of the state of the Fund's affairs as at 31st December, 1952 and the Income and Expenditure Account gives a true and fair view of the income and expenditure for the year ended on that date.*

5, London Wall Buildings,
London, E.C.2.
1st *June*, 1953.

DELOITTE, PLENDER, GRIFFITHS & CO., *Auditors.*
*Chartered Accountants.*

# THE GREAT SEAL OF ENGLAND

*A paper by*

*SIR HILARY JENKINSON, C.B.E., LL.D., F.S.A.,*

*Deputy Keeper of the Records, read to the Society on Wednesday, 6th May, 1953, with the Right Honble. Sir Raymond Evershed, LL.D., F.S.A., Master of the Rolls, in the Chair*

THE CHAIRMAN: Every civilized and organized community has, and must, I take it, have, some symbols of authority. With us, over a long period of years (approaching a thousand) the Great Seals of England have been a remarkable symbol of the continuity of our national life, and more particularly of the authenticity of documents emanating from the highest authority in the State, namely the Sovereign. During that long period the Great Seals have acquired certain traditional forms and other characteristics. Of all that Sir Hilary Jenkinson will tell you.

There is a legitimate connection between the Great Seals of England and the profession of the law, which I am privileged to represent, for it has always been among the functions of that high executive officer of the Sovereign, the Lord Chancellor, to be the Keeper of the Great Seal.

There is in my mind the recollection of an incident during the late war, when in a corner of the staircase in the Houses of Parliament there were found a bucket, a broom, and the Great Seal of England. I cannot vouch for the truth of that story. I could have wished, and it would have been proper if it had been possible, that the present Lord Chancellor, or, failing him, one of the ex-Lord Chancellors, should have been in my position this afternoon. He could, at least, have verified that story if true. But none of those persons has been able to come and you must, therefore, make do with the next best, or worst, thing, namely myself. At any rate, the Master of the Rolls during this long period of history has, at times, as deputy, been a Keeper of the Great Seal.

I hope I have said enough to whet your appetites still further for the delight which is about to come. I would only like to add three things: first, may I say how great a privilege I deem it to have been asked by this great and learned institution to take the Chair this afternoon. Secondly, I would like to say that I feel no less privileged to be able to take the Chair for my Deputy Keeper of the Records, Sir Hilary Jenkinson, for whose help in his office and for whose high scholarly attainments I have so great a respect. And third, I am glad to see here my old friend, if I may so call him, Mr. Gilbert Ledward, who, I understand, has designed the new Seal for the new Sovereign.

*The following paper, illustrated with lantern slides, was then read:*

## THE PAPER[1]

I am to try and deal in this paper with what is really only one small corner of a vast field of learning; yet it is itself so extensive that I can only hope to cover it by being extremely eclectic in my methods.

Plate I shows the two sides[2] of one of the Great Seals (he had two during his reign) of William the Conqueror. An unbroken development, unique even in this country of continuities, connects it with one which will be in use by Her present Majesty; though nine centuries and the reigns of forty Sovereigns lie between them. Moreover, it is no exaggeration to say that without the Great Seal, in the form here seen, and used as it has been used, the whole development of public administration in this country would have been entirely different. What shall we say in one short article upon so vast and complex a theme?

I have tried to imagine what might be the questions which would arise most readily in the mind of anyone who should see for the first time a series of impressions of the Great Seal of various dates; with a view to answering them so far as space allows. The questions I have in mind concern the purpose of sealing in general; characteristics of the English Great Seal in particular; its functions, early and late; the Seal itself—the Matrices—and the method of their employment; the number of Great Seals since 1066; the source of our knowledge—surviving impressions; developments in the Device and Legend; development of Deputies of the Great Seal; and the question of Royal Portraiture.

### THE PURPOSE OF SEALING

Identification of ownership or authority in any object by means of a mark impressed or imprinted on its soft or smooth surface from a ring or other engraved matrix recognizable as the property of a particular individual is as old as civilization: but I shall not attempt to take the listener back to Egypt or Ur or even to the comparatively modern Roman Empire. For our present purpose it must be enough to say that one variety of the practice—the use of wax impressions as an adjunct to written documents—was becoming a recognized usage in Western Europe by the end of the tenth century: and its purpose—let us be very clear about this, for other purposes are only later and subsidiary—its purpose was to authenticate. During the first part of the period which we generally call medieval (*i.e.* till well on in the fifteenth century) writing remained the function of clerks—in the strict ecclesiastical sense of that word—or at least of professional writers. Kings and other persons who used writing for the conduct of affairs probably could not, certainly did not, write themselves or

[1] I have to acknowledge the great assistance I have had in preparing this paper from my two Colleagues in charge of the Photographic and the Seals Sections at the Public Record Office, Mr. D. B. Wardle and Mr. Roger Ellis. My indebtedness to the British Museum and other owners of Seals and casts will be obvious from the plates.

[2] The two sides of a Seal are referred to as the *Obverse* (that which normally lies uppermost) and *Reverse*. The word *Seal* itself gives some difficulty for it is used habitually both for the impression in wax and the instrument which makes it: following accepted practice I shall use it here for the first and refer to the second as *Matrix*, or in plural *Matrices*, whenever possible.

even sign the documents which issued in their name; nor could the recipients in many cases read them. Hence the seal: and as the use of writing in the conduct of affairs became more and more common, so did the use and ownership of seals increase: till by the thirteenth century it was not uncommon for the burgess of any small town (though he can have had little writing to do) to own an individual seal of sorts. On the other hand, as the personal practice of writing became general, so did the use, and fashion, of seals decline. We are to deal with the effect of these general developments in one particular case—the use of a Great Seal by the Sovereign, in England.

### THE GREAT SEAL: A FIRST VIEW

Let me at this stage confront the reader with that series of Great Seals of which I spoke by describing briefly our first ten Plates: passing very rapidly, because we shall have occasion to look at all of them again. The first, we have seen, shows the obverse and reverse of a Great Seal of William the Conqueror.

Plate II reproduces the obverse and reverse of the first Seal (he had two) of Richard I. The matrices which made these beautiful impressions probably lie at the bottom of the Mediterranean, somewhere off Cyprus; but that is another story. In Plate III we have the obverse of two Great Seals (1219 and 1259) of Henry III; presenting at least one immediately noticeable difference in the bearded face of the second effigy.

Plate IV (*a*) shows the Seal used by Edward I throughout his reign (1292–1307); but there are signs about it of a longer life than that: and Plates IV (*b*) and V take us over another long period with obverses from two of the Great Seals (he had at least half a dozen during his reign) of Edward III. The first dates from 1327 and the second is the 'Brétigny' Seal engraved after the Treaty of that name (1360) when he dropped for the time his claim to the Kingdom of France: here again there is a beard to notice but a quick eye may detect a more unexpected peculiarity. In Plate VI we see impressions of the obverse and reverse of the 'Gold Seal', cut for Henry IV about 1408, which have even more marked individual features; while in Plate VII the reverse of a Seal of Henry VIII from a matrix engraved about 1513 introduces a specimen which is, so far as I know, unique; though it would not be surprising if that fact escaped even expert sigillographers.

Plate VII portrays also the first of five Queens Regnant (not counting Lady Jane Grey) who have preceded Her present Majesty, being the reverse of the second Seal of Mary I, which includes King Philip on both sides. Plate VIII shows the obverse from the magnificent second Seal (nearly six inches in diameter) of Queen Elizabeth I, designed about 1584 by Nicholas Hilliard. In Plate IX we have the reverse of the first Seal of Charles II, the matrices of which, engraved (abroad, presumably) after his father's death, were lost, according to Clarendon, at the battle of Worcester in 1651; and that of another King and Queen—William and Mary. The figure of the Queen in this last is, it may be thought, somewhat sketchily rendered and her horse appears to be walking on the surface of the Thames; but of that more later.

The series ends with the last two of our Queens Regnant. That of Queen Anne —the obverse from her second Seal, used after the Union with Scotland in 1707: the reverse has a figure of Britannia—seems a clumsy affair for that elegant period but is not so much so as her first. That of Queen Victoria is from her latest Great Seal—a portrait at the end of her reign.

Obviously these are very different things from the seal which we take from our finger to use on a registered letter. They are large (from 3¼ to 6½ inches in diameter); they are round; they are two-sided (and for that reason clearly cannot be applied to a surface); they bear two Devices—effigies of the Sovereign, riding[1] and enthroned—which apparently have some symbolic meaning since they have survived for nine centuries: and they are surrounded by writing —the 'Legend'.

Engravers not yet very skilled may be initially responsible for the size: but also, and increasingly as time went on, size meant importance—the importance of the Sovereign contrasted with lesser folk, or the importance of the business contrasted with what might be authenticated by a smaller seal. But observe that from the first this size implies an official custodian—the Sovereign could hardly carry about his person so large and heavy an implement; the existence of the Great Seal connotes that of the Chancellor, and the measure of its use will be the measure of the Chancellor's power and importance as an executive officer. As to shape—the circle presents the least chance of damage: the other favourite medieval fashion, that of the vesica or pointed oval (the result of the 'Gothic' taste for angles), practically never touched the Chancery. As to devices: the enthroned figure had been the distinguishing mark of the Conqueror's Saxon predecessor, and its continuance proclaimed his legal inheritance from Edward the Confessor as markedly and deliberately as did the title *Comes* —Earl—so carefully added to every mention of Harold's name throughout Domesday Book: but William was also a Duke—the leader of a band of Norman barons; and the riding warrior was already becoming, as it remained for centuries, the accepted mark of that caste. Hence the two effigies; and by the time Norman and Saxon were finally fused these had become a fixed convention of the English Great Seal. Hence also the two legends on the Conqueror's Seal—two verses, one proclaiming that he is 'patron' of the Normans—*Hoc Normannorum Willelmum nosce patronum*—the other that he is King of the English—*Hoc Regem Anglorum signo fatearis eundem*. Verse was soon exchanged for prose and the two legends combined; but the Sovereign's titles in respect of the different national elements of the realm have continued to be an essential, though constantly varying, part of the Seal down to the present day.

## THE FUNCTIONS OF THE GREAT SEAL

During the reigns of the first few Norman Kings no other Seal, so far as we know, was used to authenticate written communication in the King's name:

[1] One exception—Queen Anne's Britannia—has been noted: there is only one other, that of the first Seal of King George V, which showed him standing in naval uniform.

and the Chancellor in consequence had something to do with every department of Royal administration without exception: domestic and foreign affairs, pronouncements by the King's Council, the executive side of legal and financial business, the personal business of the Sovereign's court and household—all, so far as they depended on writing, depended on the Great Seal and its Keeper. When with the thirteenth century those wonderful series of Chancery Enrolments begin from which the Master of the Rolls takes his title we can see in the Patent, Close and Charter Rolls of John and Henry III something of this universality of function. Nothing is too small or too great to figure there, from the painting of the King's bed-chamber to the ratification of a treaty: there is, in fact, nothing which any executive Ministry now does or records, and no activity of the Sovereign's Private Secretariat, which may not be found recorded in embryonic form in the early Rolls; though already some routine matters—notably the issue of writs under the Great Seal to bring cases into the King's Courts—are omitted from them.

The issue of writs as a matter of course, *de cursu*[1], by the Chancellor upon his own authority was, in fact, one answer to two great difficulties which at an early date beset—or upset—the simple machinery of the Great Seal. The first of these, the ever-increasing bulk of public business, was met to some extent by splitting off from the Great Seal subsidiaries—'Great Seals Deputed' I have called them—to deal with specific classes of what was originally Chancery work. We shall have to speak again, though briefly, of this important topic, but may note here that so early as the twelfth century there was a duplicate of the Great Seal proper which 'resided' with the Exchequer at Westminster and covered business that could not conveniently 'follow the King'.

This necessity for 'following the King' produced also the second great difficulty, that of providing for Royal control. The medieval Court was migratory: it moved constantly from place to place: and obviously (once the resources of writing were in full use in public administration) the Monarch could retain the initiative in important affairs, and the control of those which were personal or secret, only so long as the Chancellor and the Great Seal, and (which was the crux) the staff necessary to operate it, could be in constant attendance. The reply to the situation which arose when the Chancellor's staff became a large and (inevitably) static Department was the addition of a new smaller Seal to the Royal resources: this, known presently as the Privy Seal, was called originally *Secretum* and was in charge of a new official—a *Secretarius*. Under this Seal the King could either transact directly personal or secret affairs (it was probably much used in diplomatic correspondence) or authorize ('warrant') the use of the Great Seal by his Chancellor for matters other than those which passed *de cursu*. When the Privy Seal became in turn a Department, a still smaller Seal, the Signet, and a new *Secretarius* took over these functions; and the development of this office, with an increasing responsibility to Parliament, brings us to the

[1] The name of the members of the Chancery Staff who did this work (they became ultimately a close College) is preserved in Cursitor Street, opening appropriately out of Chancery Lane.

modern transaction of that public business, which in the thirteenth century figured in the Rolls of the Chancery, by a new organization of public Departments under 'Secretaries of State' who receive Signets from the Monarch when they take office. The varieties of Commissions, Grants and Writs which, in the ancient phrase, pass the Great Seal now number only about a hundred.

But it must not be inferred from this that the Great Seal became early a nonentity. The part which it played (to take only one instance) in the development of Patent Law in the seventeenth and eighteenth centuries is evidence to the contrary. For evidence of a more spectacular kind we have only to think of the Great Seal of James II and remind ourselves that he was prepared (as the French Ambassador reported to his Government) '*l'emporter au besoin*' or (if you prefer the popular tradition) to throw it in the Thames, in order to paralyse public administration when he left England in 1688; while the added date on a new Seal hastily made for George III in 1784 recalls the 'prodigious hubbub' (in Walpole's words) that arose when burglars—or unscrupulous politicians disguised as such—broke into Lord Chancellor Thurlow's house, stole the Great Seal and delayed thereby the dissolution of Parliament. The Great Seal was still then, as indeed it is now, in the last resort *Clavis Regni*, the key of government; the accepted means, as it has always been, of authenticating the most solemn acts of the Sovereign in governance of the Kingdom.

Of the legal and legislative duties which have gradually replaced in the Lord Chancellor's high office the simpler secretarial functions of the eleventh century I shall not attempt to speak: but even these derive directly from control of the Seal. We pass to a simpler and more practical question.

### THE PROCESSES WHICH PRODUCED IMPRESSIONS IN THE GREAT SEAL

Impressions were made originally in a mixture of bees-wax and resin, either left 'natural' in colour or tinted (normally with vermilion or verdigris) according to the nature of the document. The Victorian period tried various experiments, including, surprisingly, leather; and present practice favours, I believe, a cellulose-acetate thermoplastic moulding compound. The instrument which impressed consisted, as it does still, of two slabs of metal (bronze sometimes but generally silver and on one occasion gold) weighing anything up to seventeen pounds. Being double-sided the seal impression must be pendent on a 'tongue' formed by slitting the lower edge of the document almost but not quite across, or by a parchment tag, or silk laces, passed through a double fold at the foot of the document, or in the case of later treaties in book form by attachment to the free ends of the laces with which the book is bound. Tongue, tag or laces also had administrative significance: and the tongue could be used in certain circumstances to close the document. Portions of tag and laces may be seen on the seals in some of the plates.

There still survives[1] a contemporary picture apparently showing the golden

[1] In the possession of the Inner Temple Library: it was reproduced in *Archaeologia*, (1862) and will be figured again in a *Guide to Seals in the Public Record Office* to be published shortly.

matrix cut for Henry IV (Plate VI) actively in use: the official concerned having set in successive layers the reverse matrix (face uppermost), a cake of softened wax, the laces or other attachment, more wax, and the obverse matrix (face down), applies pressure with (it is still a primitive age) a rolling-pin. Other evidences of documentary activity lie about, and two figures who may be the Chancellor himself and the Master of the Rolls look on.

### GREAT SEALS IN USE SINCE THE CONQUEST

The precise number cannot yet be stated. For all kinds of reasons too numerous to be detailed here a Sovereign may have, at some stage, an entirely new Great Seal, as our first three plates have shown. Moreover, small changes in an existing matrix were apparently brought about not infrequently by recasting the major part with a changed Legend, or even by cutting away a part of the engraved surface and re-engraving[1]; something might also be done by engraving additions in a blank space. Thus we find (Plate IV (*a*)) Edward II altering his father's Seal by the addition of castles in memory of his mother, Eleanor of Castile; and Edward III, by adding fleurs-de-lis to symbolize his claim to the Kingdom of France, carried the matter one generation further. The same King's 'Brétigny' Seal, altered in 1372 when he resumed his claim to the French Crown, with a further alteration, served his grandson, Richard II, throughout his reign and it is in fact an impression of that reign which is seen in Plate V: moreover, altered once more it was used by Henry IV for the first few years of his reign, and again by Henry V to ratify the Treaty of Troyes in 1420. We shall have occasion presently to mention two cases of very considerable addition to the engraving, but even the smallest changes, such as the deepening of the canopy over the head of James I, constitute a new Great Seal: and their possibility has sometimes encouraged writers to see change where no change was. I regretfully eliminate, for example, the alleged Great Seal of the boy King Edward V as well as one of those attributed to his father. On the other hand, the discovery of a new Seal even now is not an impossibility: not many years ago, for instance, I was able (having previously only predicted it) to establish the existence during the last year of Henry V's reign of a Seal—shown in Plate VI—with the Royal Title altered, as a result of the Treaty of 1420. Taking account of all these things we can at present go no nearer to a total than 'approximately 100'. This is leaving out the 'Great Seals Deputed', one or two of which have been included by previous writers in their lists. These offer a still more extensive field at which we must presently take a hasty glance.

### SURVIVING IMPRESSIONS

An obvious sequel to the foregoing remarks is the question—What are the sources of our information? A minor attraction of the study of seals in general

[1] There seems to be an alteration of this kind in the *Edw* of the King's name on the 'Brétigny' Seal (Plate V); unexplained since this is undoubtedly the seal used during the reign of Edward III. I can only suggest that the engraver began to put it in Lombardic letters and changed his mind in favour of black-letter. The point has not, I think, been noted before; but it comes out particularly well in the impression here reproduced.

and of Great Seals in particular is that they are to be sought in unexpected places: save by accident you will not find specimens of Chancery Seals among Chancery Records for the obvious reason that they will accumulate naturally at the receiving end. Any classes, therefore, of original documents[1] anywhere may produce a find; the archives of corporate bodies, of ancient families and even of foreign countries supplement those of public Departments in the Record Office and the collections of the British Museum, the Society of Antiquaries and similar institutions. Even for the modest illustration of the present short study, I have had recourse not only to the three last mentioned but to the muniments of one Dean and Chapter, one Cambridge college, a county family in Somerset, the archives of towns so far apart as Dublin and Tournai, and the records of the East India Company.

Researches, in short, may spread almost as far as you please into archives of all sorts. What then are the developments, adventures or associations of the Great Seal over a period of nine centuries which research has so far revealed? Of the two last we must not attempt, save incidentally, to speak; the mere list of famous men who have been charged with its keeping would be too long. But of the changes in its outward appearance something must be said.

## DEVELOPMENTS OF FORM AND STYLE

Changes are of two distinct kinds—development of style and change of content, both in the Device and in the Legend. So far as style is concerned we can distinguish in the Device—without dating too precisely—certain definite stages; and as changes in lettering roughly correspond I will treat them together. First there is the primitive style (sufficiently illustrated in our first plate), working itself out towards the end of the twelfth century in a transition which may be seen in Plate II; and associated with it first pure ROMAN and then, developing gradually, the round-backed Lombardic capital letters. The second stage (by some considered the finest) is the developed style, simple but deeply engraved, of the thirteenth century—the reigns of Henry III and Edward I (Plates III and IV (*a*)): but personally, I put the highest achievement of the engraver, in both design and execution, in a third stage, typical of the first half of the fourteenth century—the reign of Edward II and the early years of Edward III: see the graceful figure of the King in Plate IV (b). The lettering throughout these two stages is full Lombardic.

The over-elaboration of the late fourteenth century, continued and increasing in the fifteenth, gives us our fourth and fifth stages, associated with **black-letter** minuscules in the Legend. These could not be better illustrated

[1] I have not mentioned here the possibility of drawings, either original or reproduced, in print in early books such as Speed's *History of Britaine* (from which I have taken as a headpiece to this Article a print of the Great Seal of Edward the Confessor), because compared with actual impressions they are of minor importance. They are not, however, entirely negligible. The drawing, for instance, reproduced here as a tail-piece, by the great Herald, Guillim, from the counter-seal of a Seal of Henry VI for France appears to be undoubtedly from an example he had actually seen attached to a document now no longer traceable.

than in the 'Brétigny' Seal of Edward III (Plate V) and the much admired 'Gold' Seal of Henry IV (Plate VI): with their elaboration of the simple seat or throne of earlier Kings, their complexity of architectural decoration and their wealth of allusive figures (the Gold Seal includes twenty-one) and other details. The distance our Great Seals have travelled in taste and design during four centuries is well seen in the presentation of the horse on the reverses; and I wish I had space to illustrate this more liberally. The superior execution of the animal as compared with the human figure in the earliest seals is very striking, and their economical yet satisfying design contrasts convincingly with those of the later ones, in which galloping steed and flowing draperies are very skilfully but very conventionally rendered. Overlapping and ousting (gradually) the medieval comes finally the Renaissance style, with simplified and mildly classical treatment of the figure and surrounds, Roman lettering and, ultimately, much lower relief. We see in Plate VII an example of the transition; marked chiefly, in this case, by the Renaissance Roman lettering (not very well done) of the Legend.

During the Tudor and Stuart periods private seal usage became limited to the ring or fob conventions; which developed independently in a few set fashions. Sealing in the grand manner was dead save for the practice of corporations (and they often used, and still use, medieval matrices or copies of them), and in its last stages the engraving of Great Seals, deprived of its medieval background of general practice, becomes less and less of an individual craft, more and more a mere off-shoot of other arts—those of the medallist and designer of coins, the sculptor, and even the painter. The second Seal of Elizabeth I was designed by a miniaturist, Nicholas Hilliard; designs for those of Charles I by a miniaturist and a painter are still, I believe, in the Royal collections; and the primary business of the Roethier family, who engraved for Charles II, James II and William III, was at the Mint. From this point onwards, therefore, stylistic developments in the Great Seal are part of a much larger subject which we must not attempt even to outline here: but of the earlier stages our small selection of seal impressions has supplied, I hope, sufficient illustration. What I have called the content presents a much more difficult task; for almost every seal in the great series with which this lecture deals offers in its Device a wealth of noteworthy detail regarding heraldry, armour, costume, decoration, iconography, and historical or topographical allusion.

Here again is a subject, or rather a series of subjects, quite beyond the scope of a short essay. The curious reader may amuse himself by enumerating the questions—archæological, historical, and even political—which are prompted by a detailed examination of one Seal only—the 'Golden' Seal (Plate VI) of Henry IV, in the iconography of which some authorities have discovered an assertion of his claim to the throne in virtue of his descent from Henry III. Even the more obvious conventions of decoration which come and go—the greyhound which courses with a succession of equestrian monarchs from Henry VIII to Charles I; the view of the Thames (seen in Plate IX (*b*): it is replaced by more suitable scenery in the Irish, Scottish and Welsh

Seals we shall mention later) which appears from the reign of Charles I to that of George III[1]; the evolution of the throne from a single seat, unbacked, in our earliest example to the architectural elaboration of the fifteenth century (Plate VI) and thence to the simpler richness of the Renaissance Chair of State; the surrounding of the enthroned effigy with allegorical figures which comes in with Queen Anne and is seen in a moderate form in our Plate X—all these and many other *notabilia* we must note only or leave the reader to discover, if he will, at more leisure. But there is one matter of changing form, that of the Royal titles[2] in the Legend, the most fruitful cause[3], as we have seen, of new Seals, to which we must give a few words.

These changes, in fact, constitute in themselves a complete epitome of one side of English history. Taking only our own Plates we have first (Plate I) the English-Norman titles whose significance we have already noted. With Richard I (Plate II) we reach the form thereafter normal—the Sovereign's name and titles in the nominative; not the usual genitive prefixed by *S[igillum]*. The titles now include Anjou and Aquitaine which Henry II had derived from his father and his wife. Henry III, in Plate III (*a*), is still using the Norman title though his father had lost the dominion, and he keeps the *Dominus Hibernie* which John had added, and which persisted in that form till the time of Henry VIII, who changed *Dominus* to *Rex*. In Plate III (*b*) Henry, to the great indignation of contemporary writers, has dropped his claim to Anjou (following the treaty of 1259 with France) as well as changing a sword for a sceptre. Of Edward III's alternate use and abandonment of the title of King of France[4] we have already spoken; it is missing in Plate IV (*b*) but later it was re-inserted. Plate VI—bearing a specimen at present unique—reminds us of the remarkable phrase *Heres Regni Francie* added by Henry V to his father's Seal: in the specimen here shown his son—more remarkable still—finding occasion to use the Seal for a special purpose and having actually inherited that Kingdom, erases the words *Heres Regni* from the wax, leaving *Rex Anglie et . . . . Francie*. Henry VIII in Plate VII (*a*) has not yet assumed the *Fidei Defensor* which will thereafter be used by all English Sovereigns. In Plate VII (*b*) we find that Mary's ill-starred marriage has added strange places to the title of an English Queen (too many to be set out on one side of her Seal) as well as unfamiliar bearings to her arms. Finally the Seal of Queen Anne (Plate X) introduces Great Britain as a title[5] and Queen Victoria's that of Empress of India.

## GREAT SEALS DEPUTED

Returning to this question we enter upon a new, very wide and to some extent uncharted sea. I mentioned earlier the 'splitting' of the Great Seal in the twelfth century; in the thirteenth the second Seal appears in a new form as

[1] George III used also Windsor Castle ; and one of Queen Victoria's Seals (the reverse of that shown in Plate X) has an interesting back-ground showing one full-rigged wooden ship and one iron-clad.

[2] They correspond closely, but not always exactly, with those used in written documents.

[3] It was in operation as late as 1947.

[4] This claim was not finally dropped by English Sovereigns till the eighteenth century.

[5] It had been used also by William III after his Queen's death.

not only 'resident' at the Exchequer but belonging exclusively to that office and in the custody of the Chancellor's deputy there—the Chancellor of the Exchequer as he is presently called. This, the earliest departmental seal, has had also the longest career, for it exists still. It passed eventually into the custody of another Exchequer official, the King's Remembrancer; whose office, owing to certain continuing legal functions, survived when others were abolished in the nineteenth century, and in virtue of this now 'resides' in the Supreme Court, whence it is fetched when a new Chancellor of the Exchequer is received by the Sovereign. My example, the earliest known and possibly the first engraved in this form, illustrates—Plate XI (*a*) and (*b*)—two characteristics which generally, though not invariably, distinguish 'Deputed' Seals: the mention of their special purpose in the Legend or on an added scroll or cartouche, and the use of only one effigy of the Sovereign, the reverse displaying a shield of arms. Sometimes they also use *Sigillum* followed by the genitive, which, as we have seen, does not appear in the Great Seal proper.

The next century saw the Courts of King's Bench and Common Pleas similarly provided with their own Seals for the issue of their multitudinous 'Judicial' Writs: our example—Plate XI (*d*) and (*e*)—of that of the Common Pleas (a singularly perfect impression showing incidentally the marks of the projecting lugs through which pins were thrust to secure correct superimposition of one matrix on the other) is again probably the first in its series though it continued in use, with alterations, through many reigns: it bears the effigy of Edward III, what looks like a trace of the boar of Richard III, and the title of Henry VIII! Next come two which unfortunately we cannot illustrate—Henry VIII's new Court of 'Augmentations' with a full Great Seal, displaying both effigies, for its important grants out of the expropriated monastic lands, and his 'Court of Wards' with a new feature in the shape of two somewhat idealized Royal wards supporting a shield of arms above a scroll with appropriate motto. No other new seals in this category resulted, as far as I know, from other administrative changes in this and succeeding centuries: but to complete the story we must record the institution of the Patent Office which in the nineteenth century took over from the Chancery the authentication (with a smaller Seal) and the recording of letters patent for inventions: and the use in the Chancery itself, since 1877, of a smaller 'wafer' Seal for a considerable proportion of what had been Great Seal business: leaving only for the true Great Seal about one-fifth out of the total of varieties of documents issuing from the Department.

But I am anticipating; for the tale of 'Deputed' Seals is by no means all told. Another category is that of special Seals for particular countries—France, Ireland, Scotland, Wales. With much regret I must single out for even the slightest illustration only two, passing over, almost *sub silentio*, the rare and interesting medieval Seals for North and South Wales, the Judicial and Chancery Seals for the Tudor Courts of Great Sessions, and the Seals for the Principality: passing similarly the two medieval Seals (of Edward I and his son) *ad regimen regni Scocie* and the Great Seals for Scotland since 1707—a series still in being. Ireland, which I select for a brief mention, has had its own Chancery

*British Museum, Department of Manuscripts* XXIX. 8

PLATE I. *First Seal of William I: Obverse and Reverse*

Durham, Dean and Chapter

PLATE II. *First Seal of Richard I: Obverse and Reverse*

*Public Record Office, L.342/315*

*Public Record Office : Wards 2/146 L.34*

PLATE III. (a) *First Seal of Henry III: Obverse* (b) *Second Seal of Henry III: Obverse*

*Durham, Dean and Chapter*

PLATE IV. (a) *Seal of Edward I altered for Edward II: Obverse*

(b) *Second Seal of Edward III: Obverse*

*Public Record Office, D.L. 10/524 (Photograph from a cast)*

PLATE V. *'Brétigny' Seal of Edward III: Obverse and Reverse*

PLATE VI. *Golden Seal of Henry IV, altered for Henry V and used with erasure by Henry VI: Obverse and Reverse*

*Town Archives of Tournai*

PLATE VII. (a) *Seal of Henry VIII for Tournai: Reverse*

*Cast in the possession of the Society of Antiquaries*

(b) *Seal of Philip and Mary: Reverse*

British Museum, Department of Prints and Drawings



Public Record Office : Wards 2/14/6

PLATE VIII. (a) *Queen Elizabeth: Sketch by Nicholas Hilliard for a Great Seal for Ireland*

(b) *Second Seal of Elizabeth: Obverse*

Original Letters Patent lately in the possession of Colonel Walter Honeage

Original Letters Patent in the Muniments of the East India Company

PLATE IX. (a) *First Seal of Charles II: Reverse* (b) *Seal of James II altered for William and Mary: Reverse*

Casts in the possession of the Society of Antiquaries

(b) *Fourth Seal of Queen Victoria: Obverse*

PLATE X. (a) *Second Seal of Queen Anne: Obverse*

(a) and (b) *Durham, Dean and Chapter*; (c) *Original Letters Patent in the Muniments of the Corporation of Dublin*; (d) and (e) *Public Record Office E.328/118.*

PLATE XI. (a) and (b) (top) *Seal of the Exchequer, Edward I: Obverse and Reverse.* (c) (centre) *Great Seal for Irish Chancery: Edward III altered for Richard II: Obverse.* (d) and (e) (bottom) *Seal of the Court of Common Pleas; Edward III altered for Henry VIII: Obverse and Reverse*

*Original in Private Possession* *Public Record Office S.P. 9/198* *Public Record Office C.O. 9/1*

PLATE XII. (top) *Seal of James I for Virginia: Obverse;* (left) *Seal of George II for New York: Obverse;* (right) *Seal of George III for Leeward Islands: Obverse*

from the thirteenth century, rivalling the English Exchequer in length of days. It also copied this country to the extent of having separate Seals for its Courts of Exchequer, King's Bench, Common Pleas, and even Wards: I can only show, in Plate XI (*c*), one example—a singularly perfect impression of the Chancery Seal of Richard II, or actually his grandfather (note the clumsy alteration of EDW to RIC), without indication of its special purpose. Seals for my second selection—France—during the periods of English rule in various parts provide too complicated a story to be detailed here. The Great Seal proper of Henry VI as King is particularly interesting because an English King there uses the French convention of a small counter-seal of arms instead of a reverse; illustrated here in the tail-piece to this paper by a reproduction of the drawing by Guillim mentioned above. This feature is surprisingly reproduced with an English obverse in a unique Seal made specially, it seems, to ratify the Treaty of Etaples in 1492; and at least two other treaties produced unusual Seals; but I have chosen for reproduction here one side of what is, so far as I know, a unique impression of Henry VIII's extraordinary Seal for the town of Tournai during its English occupation between 1513 and 1519. In all respects save one this is an English Great Seal, and I must plead guilty to having shown it previously—in Plate VII (*a*)—in that guise. Its only peculiarity is the placing of France before England in the Legend (as was done for political reasons in certain Seals of Edward III); suggesting that had the ambitious schemes of Henry about this time materialized, this might have been his Great Seal for his Kingdom of France.

Yet another category is furnished by the Great Seals for Palatinates and Marcher Lordships: private jurisdictions (which by their nature would have a Great Seal of Royal characteristics) when these came permanently or temporarily into Royal hands. Of the two permanencies—the Palatinates of Chester and Lancaster, Royalties since the thirteenth and fourteenth centuries respectively—Lancaster supplies us with examples down to the present day: but here again we must deny ourselves illustration. The possibility of strange Seals when, *sede vacante*, a Palatinate is in the King's hands is particularly intriguing: the Prince-Bishopric of Durham supplies some interesting examples; and elsewhere a single lucky find (as in the case of a fragmentary Seal of Henry VII for the County Palatine of Pembroke) may give us information of a once extensive jurisdiction now almost unknown or forgotten.

Finally we come to the Deputed Seals for Colonies, latest development of seal-making in the grand manner. It is a subject still inviting much investigation here and abroad, and I must be content to say that from the sixteenth century onwards the obvious difficulty of conducting Great Seal business (such as the Grant of Lands) in far distant countries from England produced the natural result of 'Deputed' Seals in the custody of their Governors. It was to be expected perhaps that in these cases designers and engravers would give more play to their imagination, and Virginia (James I's 'fourth Kingdom') leads the way (Plate XII (a) ) with the unique and revolutionary use of the pointed oval and a three-quarter-length effigy for a Great Seal. But iconographically these

Colonial Seals are all of special interest because of their departure from the accepted conventions in presentation of the Sovereign's portrait. It may be that we shall find yet others after the first Virginian model; but later the King and Queen are generally shown in some fanciful surroundings supposed to represent strange conditions or strange peoples—receiving gifts, in which the eye of faith discerns tobacco, from admiring natives, as in the Seal of New York, or riding in a highly mythological manner over the sea as that of the Leeward Islands, both of which are here illustrated (Plate XII). Finally we even get the adventurous conditions without the portrait, as in the case of the likeness of a ship of war off the Bahamas, with a motto telling of the ending of piracy in those waters, and another of the sequoia forest of New Brunswick. Note that, belonging to the period of low relief in engraving, these Seals of the late seventeenth and eighteenth centuries lend themselves to the use of a single side for an impression applied to the paper, not pendent; which may conceal the fact that they were actually double ones, with the Royal Arms on the reverse.

With regret I leave a large section of Great Seal study (not the less interesting for its late date), which I have only touched upon here and elsewhere, to other hands. For present purposes the points I have just mentioned may serve to bring us back in conclusion to my final question.

## THE ROYAL PORTRAIT

One of the most curious things in the history of Seals is the way in which, in almost all periods, men seem to have been able to combine veneration for Seals (in the fourteenth century it became high treason to counterfeit the Great Seal) with looseness in their employment. This is particularly seen in the use by successive generations of a single Seal in spite of the fact that it bears an effigy by which it is supposed to be distinguished. We have seen above examples of this in the case of Royal Seals of Edward II, Edward III, Richard II, Henry V, and Henry VI; the last a particularly remarkable case for reasons we have already noted. Others hardly less remarkable might be cited, but perhaps most curious of all is the fact that one side of the Seal of James II—either fished out of the Thames or somehow reproduced—was used throughout by William and Mary (whose figure and horse are so clumsily added) and after the Queen's death by William alone, in its original state. In the case of the Colonial Seals (presumably considered less important) procedure may be even more irresponsible: we have one instance of a Seal of James II, altered for William and Mary, and used without further alteration for Queen Anne!

On the other hand we have evidence that even medievally some attention might, *ceteris paribus*, be paid to portraiture: though not perhaps on the equestrian side, where inaccuracy would not amount to more than showing the King in obsolete armour. Thus the making of a new Seal necessitated (as we have seen) by the Treaty of Abbeville in 1269 gave an opportunity to substitute a bearded figure for the youthful one of 1259: and similar changes may be found in the long reign of Edward III: while in that of Henry VIII there is clearly an attempt at something more. For serious portraiture, however, we must, I think, wait

a little longer. It comes with what I have called the decline of the Seal, but that is also the period of the first great miniaturists and the beginning of a great school of English portrait painters: it coincides also (appropriately for my present purpose) with the first appearance of a Queen on the Great Seal in the beautiful effigies of Mary and Philip. This is perhaps a work of foreign origin, but in the design by Hilliard for the Second Seal of Queen Elizabeth I we have a native production and one which, though it may not give complete satisfaction as a seal, is certainly good portraiture and fine drawing, as is shown by Hilliard's unfinished sketch reproduced with the Seal in Plate VIII.

With the Great Seal of the first Elizabeth, and all of good augury and hope which it implies, this paper, written at the time of the Coronation of Queen Elizabeth II, may fittingly conclude.

BIBLIOGRAPHICAL NOTE

The standard work on this subject is *The Great Seals of England*, published in commemoration of Queen Victoria's Jubilee in 1887, by A. B. and Allan Wyon; members of a family which engraved a number of Great Seals. They collected much new information and illustrated it with what were, for the date, remarkably fine photographic reproductions: but their work is unfortunately defaced by numerous inaccuracies in the text, and some unreliability in the plates; in regard to which see my notes in the *Antiquaries Journal*, XVI, XVIII and XXIII. It also neglected almost entirely what I have called "Great Seals Deputed": which were described for the first time as a whole in my article in *Archæologia*, LXXXV (1936). Published also in 1887 was the first volume of the British Museum's printed *Catalogue of Seals*, by W. de G. Birch, in which Royal Seals are included. For information on the administrative side the reader may turn to Sir H. C. Maxwell-Lyte's *Notes on the Great Seal* (1926) and the numerous other works there cited.

## DISCUSSION

THE CHAIRMAN: It must always be a difficult question to decide which is the greater joy, the joy of anticipation or the joy of satisfaction. That is a point upon which, speaking as a judge, I prefer myself not to indicate any concluded opinion. This lecture which we have heard with such delight has, I am sure, this supreme virtue; that all Sir Hilary's hearers will have realized—some of us, perhaps, for the first time—what an enthralling subject the story of the Great Seals of England is, and how much there is of our history to learn from it. Probably all of us will now have been inspired by a great wish to hear a lot more and learn a lot more.

On the principle, then, that "good wine needs no bush" I should like, on your behalf, to thank Sir Hilary most warmly for his absorbing lecture, and may I add also our thanks to his collaborator in the mechanical box opposite.

*The vote of thanks was carried with acclamation; and, another having been accorded the Chairman, the meeting ended.*

# IMPROVING COAL PRODUCTION

*The Cadman Memorial Lecture by*

*E. H. BROWNE, C.B.E., M.A.*

*Director-General of Production, National Coal Board, delivered to the Society on Wednesday, 25th February, 1953, with Major W. H. Cadman, M.B.E., B.Sc., F.R.I.C., in the Chair*

THE CHAIRMAN: It gives me very great pleasure to take the Chair at this memorial lecture in honour of my eldest brother, the late Lord Cadman of Silverdale, whose death at the comparatively early age of sixty-four was, in my opinion, largely due to "burning the candle at both ends".

Sir Frank Smith, in the touching obituary notice to Fellows of the Royal Society in 1941, wrote truly, "When the war broke out in 1939, he was far from well, but he could not resist the pressure of the call to public service and flung himself into the turmoil. He served as honorary principal adviser in oil to the Government, and in the Ministry of Supply, and he became the first Chairman of the Scientific Advisory Council. In these and other ways he undertook loads incommensurable with his strength, and a career of public service, almost without parallel in its magnitude and many-sided activities, was ended by the sacrifice of life itself."

As coal was my brother's first love, and he maintained a devoted interest in coal mining to the end of his life, being first and foremost a mining engineer, it was decided in 1945, at the suggestion of the then President and Chairman of Council of the Royal Society of Arts, Dr. E. F. Armstrong, F.R.S., to inaugurate a memorial lecture dealing with the coal side of Lord Cadman's activities, "as an expression of the country's gratitude for the life and work of one of its most distinguished Fellows". He was a life Fellow of the Society. A memorial fund, to which many of his old friends, mining colleagues and pupils subscribed, was vested in the Royal Society of Arts, who undertook to arrange a lecture every two years, with the advice and assistance of the Institution of Mining Engineers in the selection of a title for an appropriate lecture and of a suitable lecturer of distinction.

It is now my pleasant task to introduce to you Mr. E. H. Browne. His subject, "Improving Coal Production", is very topical to-day, and will, I am sure, prove interesting not only to the mining engineers and others connected with coal mining whom we welcome here this afternoon, but also to all coal consumers who have every reason to be getting somewhat alarmed at the increasing price of coal, and its repercussions in so many directions.

I need not say much to introduce Mr. Browne, as he is well known to many of the audience. He has studied at the University of Cambridge and at Birmingham, where my brother was Professor of Mining for many years. He then became a colliery manager, a mining agent, and a director of collieries. During the war he was Group Production Director for the North-Western Region of the Ministry of Fuel and Power. In October, 1946, he was appointed Production Director to the National Coal Board's North-Western Division, and in June, 1948, he became Chief Mining Engineer (Reconstruction and Planning) at the Board's national headquarters. In April, 1949, he became Director-General of Production to the National Coal Board, a position which he still holds.

*The following lecture was then delivered:*

## THE LECTURE

I feel it is a great honour to be asked to deliver this address in memory of Lord Cadman, whose work was of such outstanding importance in the coal industry, and I can imagine no subject which would have been nearer his heart, were he alive today, than that about which I have been invited to speak—"improving coal production".

The subject is near my heart too. I interpret this title as comprehending an improvement of both output and efficiency. This is indeed the basic task which faces us in coal-mining; and I shall try in this paper to assemble what I believe to be the cardinal needs to accomplish it. Of most of these needs I have spoken before, because they are to my mind the fundamentals: in this paper I shall try to draw them together as a conspectus of those things upon which the future success of coal-mining in this country will, I believe, depend.

In the last six years we have made significant progress in many aspects of coal-mining; much of this progress has not yet had immediately apparent results. But to-day, because I wish to concentrate attention on the things which need to be done, I shall to some extent ignore the record of achievement. I shall direct attention to our weaknesses rather than to our strength.

It will perhaps be useful first to give a brief summary of the trends of output and productivity in coal-mining since the beginning of the century. The earlier and more recent figures are not precisely comparable, but the broad picture is as follows:

| | *Number employed* | *Output* | *Productivity* | | *Annual Output per Man Employed* |
|---|---|---|---|---|---|
| | | | *Face* | *Overall* | |
| | *Thousands* | *Million Tons* | *Cwts. per man-shift* | | *Tons* |
| 1903–1912 (Annual Average): | 936 | 254 | Not available | | 271 |
| 1913 | 1,107 | 287 | Not Available | 19·6 | 259 |
| 1922 | 1,094 | 250 | 44·8 | 18·0 | 228 |
| 1927 | 998 | 251 | 50·0 | 20·6 | 251 |
| 1930 | 917 | 244 | 52·2 | 21·6 | 266 |
| 1933 | 772 | 207 | 54·7 | 22·4 | 268 |
| 1938 | 782 | 227 | 58·0 | 22·8 | 290 |
| 1948 | 724 | 198 | 58·4 | 22·2 | 273 |
| 1952 | 715 | 214 | 63·0 | 23·8 | 300 |

The peak of production was in 1913. After the disturbance brought about by the first World War the story is well known; although the bleak prospects were not immediately obvious, the industry ran into increasing trouble throughout the 1920's, and by the 1930's the country did not want anything like the quantity of coal which was available.

The position since the last war has, of course, been the reverse; more coal has been wanted than could be produced though the gap is now closing.

Productivity is a crude measure of efficiency, if only because it takes account only of part of the industry's total drain on the country's resources; it ignores the materials and services which have to be provided from outside the industry. Costs are the only overall measure we have of human effort. Cost comparisons over the years are, however, made difficult by changes in wages and the value of money, as well as changes in statistical bases. Nevertheless, the following figures give the broad picture over the last forty years:

| | *Cost per ton (saleable)* | | *"Real cost" per ton*[1] *at 1909–1913 levels* | |
|---|---|---|---|---|
| | *s.* | *d.* | *s.* | *d.* |
| 1909–1913 Yearly Average: | 7 | 9 | 7 | 9 |
| 1913 ... ... ... | 8 | 8 | 8 | 3 |
| 1922 ... ... ... | 16 | 8 | 10 | 3 |
| 1930 ... ... ... | 13 | 6 | 11 | 4 |
| 1933 ... ... ... | 13 | 0 | 17 | 4 |
| 1938 ... ... ... | 15 | 11 | 14 | 3 |
| 1948 ... ... ... | 45 | 7 | 14 | 1 |
| 1951 ... ... ... | 49 | 2 | 9 | 10 |
| 1952 (9 months) ... | 56 | 4 | 11 | 11 |

I shall not delay to consider how good or bad this trend has been, or the factors which have combined to make it so, but rather accept it as axiomatic that improved results must be obtained in the future; and I turn to the big issues on which, I suggest, the future in fact depends.

## NATIONAL PLANNING

Whatever views may be held about central economic planning in general, there can be no doubt that for coal-mining it is essential. A National Survey and a National Plan were not only made possible by the unification of the industry: it was precisely that unification that brought to a head and made clearly apparent the *need* for an overall policy and plan for the development and reconstruction of the industry. That is what the National Plan is—a broad programme establishing the future production levels in the various coal-fields and the rate and extent of exploration and capital development in each. This Plan had to be based on a comprehensive survey of production possibilities, which was then related to

[1] Related by the Sauerbeck Wholesale Price Index.

forecasts of demand: it had to be capable of being remoulded according to the new information which becomes available at any time—whether from the side of demand or from the unfolding of new knowledge of production capacity, for instance about hitherto unproved coal reserves.

The Plan therefore is on very broad lines, and by no means immutable; it is a prerequisite for the proper development of the coal resources of the country; it provides the framework within which the development and reconstruction of the industry must be worked out. It is true that there is a second and interrelated aspect of the Plan: the build-up of individual schemes of reconstruction or new developments, which, though flexible and subject to revision in detail as each project is worked out or as conditions change, constitute the physical programme of reconstruction. But in its primary aspect the Plan is a programme of production and investment targets.

There has been a good deal of misunderstanding about this Plan, and figures have been quoted out of their context, without reference to the assumptions to which they were tied. For instance, one thing the Plan did not do was to forecast future levels of productivity and cost. These indices of results will, of course, be the ultimate measure of success. In order to make the Plan it was necessary to handle an enormous number of estimates, to correct and modify them as we went on: but the whole purpose of these estimates was to provide means for making the Plan and not a basis on which to forecast. The forecasts derivable from the estimates were incidental to the Plan—a means to an end and not an end in themselves.

## TOTAL OUTPUT

The Plan was related to an assumed demand of 230 to 250 million tons a year, and for convenience the mid-point of 240 million tons a year was used in the forward period reviewed, 1961-65. It was, however, clearly understood that this was not the maximum output available; a larger production might be produced partly by maintaining more "marginal" pits at work—pits high in cost and low in productivity—provided, of course, that sufficient man-power was available.

The Ridley Committee have recently estimated in their Report[1] that the demand in ten years' time might be of the order of 260 million tons, but they infer, wisely if I may venture to say so, that the aim should be to reduce this potential demand by improving efficiency in the use of fuel; and they make it abundantly clear that there is ample scope for this.

To aim for this larger capacity does not call for any significant change in the pattern of production of the Plan. We can see ways in which the pattern needs to be reshaped here and there. For instance, we could not see, five years ago, how to utilize the full possible expansion of production of "general" coals from the Midland fields, attractive though these were from the point of view of production cost and available resources. But in the light of a closer examination of distribution problems and an increased forecast of electricity demand, it is now possible

[1] *Report of the Committee on National Policy for the use of the Fuel and Power Resources* (Cmd. 8647).

to postulate a larger production from these areas. Another assumption, which may need to be modified, was that open-cast production would have ceased by 1961–65. It is now considered that open-cast may still be able to help at that time.

On the other hand, it is only possible to foresee an output equivalent to the Ridley Committee's expectation of potential long-term demand under two conditions. First, that sufficient labour is available to enable us to maintain in production collieries which it had been hoped to close in the next ten years, and, secondly, an aspect which I shall emphasize in a moment, that the programme of reconstruction is really speeded up.

It may, however, be open to doubt how far production ought to be pressed towards the maximum limits, because it is likely, in my view, that every increase in the output figure is likely to be accompanied by a sharp rise in the cost of production of the "marginal" tonnage.

A proportion of total output is being produced today at considerable loss. Thus in 1951, on inland prices, 21 million tons out of the total of 210 millions from mines operated by the N.C.B. was produced at an operating loss exceeding 10*s.* 0*d.* per ton. Ten million tons of this involved a loss of £11¼ million, or an average of 23*s.* 0*d.* per ton. Moreover, within this, 2½ million tons caused a loss of £4 million, or an average of 32*s.* 0*d.* per ton, and the final 1 million tons a loss of over £2 million—an average of 42*s.* 0*d.* per ton.

Now it is well known that the Board's price structure is not yet perfected and that it can only become so by stages: for this reason alone profits and losses are not, and perhaps can never be, wholly reliable criteria. The highest cost element includes special kinds of coal—anthracite and some of the coking coals. In addition the variability of colliery results is much greater than that of other industries, and high losses will not necessarily be prolonged in individual cases, whilst even profitable pits have their bad spells. Short-term "marginals" are not necessarily long-term ones. But profits are the only overall measure; and although they do not indicate precisely where the coal should be got, they show up the significance of marginal tonnage on the economy of the industry as a whole.

How will this be in the future? It is impossible to forecast actual costs owing to uncertainties about the changing values in money, in relative wages, prices of materials and so on. But we can form a judgment of how the cost pattern of total tonnage will be likely to move. The elimination of the worst elements will, of course, help to reduce the disparities; and the reconstruction programme will, by raising substantially the efficiency of the surface, of the shafts, and of the underground transport systems of many collieries, exert a strong force compressing the limits of the costs bracket.

On the other hand, other factors will work in the opposite direction. Face productivity, the importance of which I shall stress later in this address, will in the future be governed by new kinds of mechanization and new face techniques. All the indications at present are that new methods and machines will achieve success more readily in the easier conditions, where productivity is already higher than the average. Heavily faulted strata, high inclinations and similar difficult mining conditions present considerable obstacles to mechanization; thin seams,

though no doubt susceptible to new techniques of coal-getting, restrict the manœuvring of machines and militate against the use of various types which are adaptable to thicker sections; and thin seams do not offer the concentration of production which is possible from thick seams. Roof control problems and high gas emission, which are often (though not always) associated with great depth, are impediments to increasing mechanization. Thus in general the easier the conditions the better the chance of introducing new machinery and techniques; and from this it follows that we may expect the advantage conferred by favourable physical conditions to increase rather than diminish.

In this connection we must not close our eyes to the fact that coal is getting more difficult to mine every day. The shallower coals, the thicker seams, have almost invariably been, and are still being, taken first. Many reconstruction schemes are being undertaken not solely or even primarily to improve efficiency (though they carry this with them) but are to develop new seams, and these new seams are more often than not deeper, thinner or inferior to those which have been got before.

In addition—and this is important—any trend towards equalization of wages between districts will widen the disparities of cost yet further: although there are notable exceptions, the low productivity coalfields in the main tend today to have lower wages than the high productivity areas. Historically this situation is understandable: but a movement away from it will inevitably exaggerate the differences in cost between the high and the low productivity regions.

It seems likely therefore that the rate of increase of cost in the marginal zone will rise very rapidly indeed in the long term; and every extra ton produced will add an increasing burden to consumers as a whole.

What is the moral of all this? If my prognostications are right they show how urgent and vital is the need to minimize the consumption of coal; in the national interest capital expenditure on means to effect economy should not be related to average costs of coal production, but to a very much higher figure; and to aim for the biggest total output which is technically possible may not be as attractive a proposition in national economics as a superficial knowledge of the situation might suggest.

This is, of course, not strictly within the mining engineer's field: it is his job to produce as efficiently as he can the amount of coal the country requires. But marginal costs are very much his affair and the level of demand ought to be directly affected by these marginal costs.

## THE RECONSTRUCTION PROGRAMME

Turning now to the other sense in which the "National Plan" is used, there will be no need for me to emphasize that the comprehensive physical reconstruction of the collieries is urgent. A past Cadman lecturer, and one far more eminent than I, Sir Charles Reid, has left us under no illusions.

This formidable task of reconstruction and development remains, at the moment, a matter of anxiety. The programme has not kept up to schedule for a

variety of reasons, some of which have their origin in the industry's own weakness. It is no secret that the mining industry was not geared up to planning and executing a vast reconstruction programme. Moreover, it is an inescapable fact that it has been backward in its technical organization and particularly weak in respect of planning. Another influence which has operated against progress has been the pressure for immediate production, and the conflict between this and the long-term objective.

The rate of capital investment of the industry has improved a little lately, the result after a long time-lag of schemes initiated two, three or four years ago now getting into their stride. Capital expenditure on the collieries only[1], compared with that envisaged in the National Plan estimates, has been as follows:

| | *National Plan Requirements* | | |
|---|---|---|---|
| *Year* | *At 1949 Prices* £ *million* | *Adjusted for Price Increases* £ *million* | *Actual Expenditure* £ *million* |
| 1950 | 30 | 32·5 | 24·6 |
| 1951 | 37 | 46·4 | 26·5 |
| 1952 | 43 | 58·9 | 36·0 (Estimated) |
| 1953 | 40 | 56·9* | |
| 1954 | 36 | 51·2* | |
| 1955 | 34 | 48·4* | |

*at 1952 prices

These figures relate to total capital expenditure at collieries. They are therefore somewhat deceptive as regards the reconstruction programme, since they include all the minor spendings, short-term projects and portable or other equipment needed for current purposes. In the early years of nationalization expenditure on the latter was inflated by immediate requirements, partly to recover ground lost during the war years and partly to raise standards of equipment at the backward collieries. Expenditure on the larger schemes, those costing over half a million pounds, has been as follows:

| *Year* | *Total Expenditure Collieries only* (*a*) £ *million* | *Expenditure on Schemes costing over* £½ *million* (*b*) | *Per cent of* (*b*) *to* (*a*) (*c*) |
|---|---|---|---|
| 1947 | 14·6 | 0·56 | 4 |
| 1948 | 20·9 | 1·51 | 7 |
| 1949 | 27·0 | 2·81 | 10 |
| 1950 | 24·6 | 4·93 | 20 |
| 1951 | 26·5 | 6·73 | 25 |
| 1952 (estimated) | 36·0 | 12·0 | 33 |

[1] Excluding deep boring, central workshops, power stations, and other services for the collieries and excluding coke ovens and other expenditure not concerned with collieries.

If we are "to improve coal production" in the sense of producing anything like 250 million tons per annum at a reasonable average cost and without an excessive volume of high cost tonnage; if indeed we are to produce that level of output at all, we must speed up the reconstruction and development of the collieries, within the framework of a National Plan designed to give the best overall exploitation of the coal-fields of the country.

## THE COAL FACE

When we speak of "reconstruction" of the industry, we usually mean changes in the surface, the shafts and winding arrangements; and the underground structure of the mines—the layout and transport. Drastic improvements in these are necessary and big new developments are required to maintain the capacity of the pits as well as to improve production and efficiency. But there is another vital component in our work, indeed the fundamental: the process of mining the coal itself at the coal face.

Face work can be divided broadly into the process of getting the coal from its natural situation, loading it, and carrying it to the roadways; and the associated processes of supporting the roof, providing the services, and constructing the roads which have to be formed as the face advances.

For a long time the industry has employed the orthodox British longwall system (adopted widely as greater depth and difficulties led to the displacement of Bord and Pillar systems) usually with coal cutting and conveying, and working on a 24-hour cycle of operations. The concept of this method has not changed over twenty or thirty years, but the proportion of output got by it with the help of machinery has risen very substantially; and so has the quality of the equipment.

The orthodox way of assisting the *coal getting* process by machinery is the slotting of the seam with coal-cutters to provide the relief needed to make blasting safe and effective. The proportion of total output of coal cut mechanically in this way rose from about 31 per cent in 1930 to 58 per cent in 1938, and is now over 80 per cent. About 8,500 coal-cutters with an aggregate horse-power of 375,000 are employed. About 10 per cent of total production is got with pneumatic picks; and there is a certain amount of soft easily won coal for which no mechanical aids are required.

The drilling of shot-holes by means of electricity or compressed air is now universal. Since 1938 the number of mechanical drilling machines used in coal has grown from about 3,900 to over 12,300.[1]

In the process of *carrying* the coal, shovelling into a small tub and manhandling the tub from the face to the haulage road has been very largely replaced by mechanical conveyors. A year ago nearly 200 million tons were conveyed on the face and only 28 million tons loaded into tubs. Over four hundred miles of conveyor had been installed on the face, and a further 1,400 miles of conveyor were in use on the roads, making about 1,800 miles in all. The proportion of coal moved in this way either on the face or in the roads increased from 53 per cent in 1938 to about 90 per cent.

[1] The differences are actually greater owing to a statistical change.

This has meant a considerable increase in the amount of conveying equipment. In 1922 there were about 930 face conveyors; in 1938, 5,620; to-day nearly 10,000.[1] The figures for roadway conveyors are not available so far back; but since 1938 they have increased from 2,200 to about 9,500.[1]

These processes of loosening the coal and conveying on the face have thus been very widely developed; there has not yet been a large scale mechanization of the intermediate process between the two, that of loading the coal on to the conveyor, though a good deal of pioneering work has been done. Only about 5 per cent of the present output is power loaded.

The first power-loading machine to replace the shovel to any substantial extent was the Meco-Moore which, after more than ten years of trial and development, came into effective use in 1944. To-day there are about a hundred machines in use loading about six million tons of coal per annum. This is as yet the only significant contribution, in terms of tonnage, to real mechanization of the coal-getting process. The Meco-Moore follows and extends the slotting principle by the use of a number of cutting chains, and gets and loads the coal in one operation. It is an extremely useful machine, but unfortunately it will only work in favourable conditions, and although some extension in its use is possible it cannot be expected to yield a large proportion of the country's output. Where it can be applied successfully, face productivity is substantially raised. So far it has been used almost entirely with a continuance of the traditional twenty-four hour cycle, but it is not necessarily restricted to this.

In the last ten years a number of other machines employing cutting chains have been designed: some have failed partially or completely; others are still in the experimental stage and show varying degrees of promise. New machines using cutting heads, champfering the coal off instead of slotting it, have recently been developed, and one at least has promise of being important; but it is always prudent in coal-mining to await trials under varying conditions before jumping to conclusions about the extent to which new machines can be applied.

There is a second way of attacking the coal, in the manner of a plane or a plough, shearing it from the coal face in slices. Several machines of this type are being used and, while some of them have met teething troubles, others are very promising, particularly the various forms of coal ploughs brought over from Germany and now being developed in this country. There seems little doubt that ploughing in one form or another will have an important contribution to make. To-day the tonnage handled is still small, but there are several installations where the results are encouraging; and though ploughing techniques are particularly well adapted to the softer coals of the Continent, I believe they can be applied if not in the simplest form to a wider range of our coals than was first thought.

There are other quite different types of machines on trial and some used to a limited extent on production, such as the Bord and Pillar continuous miner from the U.S.A.; and experimental work will soon be done with augers—large drilling machines which bore out the coal. The application of these may be limited

[1] The differences are actually greater owing to a statistical change.

but they are interesting lines to be pursued for special purposes. Moreover, continuous miners on American lines may prove adaptable to longwall work.

It has, however, to be admitted that the effective contribution of power loading is still very small; and as far as results to-day are concerned it is therefore necessary to judge mechanization of the coal face primarily in terms of getting and carrying the coal to the roads. The increase of mechanization within this limited field is reflected in the horsepower installed per face worker, which has increased since 1943 from 1·34 to 2·05.

Moreover, the improvement in the quality of equipment has been great in recent years. Since the vesting date about 4,100 new coal cutters, and 15,500 conveyors have been supplied to the collieries at a cost of about £20 million (excluding spares and belting). Equipment in this category supplied in the year 1951 alone cost £4 million.

As regards the processes on the face associated with coal getting—the setting of temporary roof supports and withdrawing them, the building of packs or other permanent roof supports, the construction of roadways at the face and the provision of services—some improvements are on the way. Supports which are adjustable in height and fitted with devices for quick setting and quick release are being introduced rapidly: over 85,000 of such props are in use. These not only reduce the amount of labour involved but they give better roof control, an extremely important factor in coal-face work.

The building of packs by mechanical means has received much thought and experiment in the last ten years, and both pneumatic and mechanical devices are now in use. The number of machines has risen from 6 in 1947 to 75 at the end of 1951. The majority of these are pneumatic but some are mechanical types. This is a field where much pioneering work remains to be done.

The latest types of "armoured flexible" conveyors do not have to be dismantled and rebuilt for moving forward to new positions as coal is extracted. They are advanced as a whole, usually by power-operated jacks. They not only reduce the amount of labour involved but also provide opportunities for minimizing the amount of working face exposed, and, in conjunction with new kinds of support, they help towards improved roof control.

Now it may well be said that with the new machinery, even if most of it is on orthodox lines, and with improvement in local layout at many collieries, the increase in face productivity has been disappointing, even after allowing for the fact that we are moving always to deeper, thinner and less easy seams. In fact it has risen from 52·2 cwts. in 1930, to 58 cwts. in 1938, and was about 63 cwts in 1952.

But whether these figures are disappointing or not, it is certain that we must do better. Face productivity is fundamental to our overall efficiency. The machinery which we have at present, and even the promising ideas on which we are working, will not be enough; we must seek for really new methods at the face.

While the reconstruction of the collieries can give computable results we do not know what can be achieved in coal-face work. The field is one for imagination and initiative. The results will be profoundly important.

### THE IMMEDIATE AND SHORT-TERM POLICY

I said earlier that over-emphasis on immediate production could conflict with essential long-term development. This is true of production—but not of productivity. An attack on the problem of present efficiency is complementary rather than contradictory to long-term considerations.

I believe that a great deal can be done, and done immediately, under the existing conditions of the pits, and much more as a result of quite small expenditure. Mining, like many other industries, offers much scope for raising efficiency by better management control and improvement in the details of operation. This can go hand in hand with reconstruction, and the success of the latter will depend not a little on the success of the former.

### TECHNICAL MANAGEMENT

It is peculiarly ironic that the industry should so often be criticized for having a top-heavy force of officials; for the truth is that, especially in relation to the complexity of coal-mining today, its technical management is extremely "light."

It is not, however, just a question of numbers: the industry needs to develop a more modern system to meet the complicated needs of the day and the future. The general pattern of organization set up by the Board has, of course, brought about the creation of a "vertical" chain of command: this is the automatic effect of integration. But the essential structure and methods of technical management have remained much as they were. Indeed, in my view, coal-mining has inherited a concept of technical control which is out of date in the twentieth century and impotent in the face of the tasks of today. In its infancy and youth the mining of of coal was a kind of natural art or a craft; but today it is an industrial engineering complex, technically as elaborate as any, and one of the most exacting ones in the world to manage.

Although references are frequently made to "all these specialists" and so on, we are in fact today only on the fringe of specialization. To manage the industry efficiently, let alone to plan and execute a vast reconstruction programme as well, calls for the development of strong lateral branches of technical control; for the building up of a real planning organization; for the strengthening of service departments such as mechanical and electrical engineering; and for the establishment of specialist services in the field of mining itself. The idea of this development is so complete a departure from the industry's established tradition—and what may be described as its emotional background—that it often meets conscious or sub-conscious resistance.

By planning in this context I mean actual colliery planning, mining layout and engineering design, not the central economic planning which I have already discussed. Mine planning has made great advances in recent years, but it is often still crude or only partly done; and planning staff is weak and overloaded; decisions are sometimes based far too much on instinct, prejudice or dogma and too little on real calculation. The work is often left to busy management officials who cannot combine their management duties with this equally essential task.

And it must be realized that planning is a continuing need in an extractive industry and is not merely required for reconstruction schemes and new sinkings, though these add a heavy additional burden.

If we are to "improve coal production" I believe that planning work must be recognized as being of equal importance with operational management; that a new conception of technical management is needed in the industry which makes a division between the two; and that we must be ready to share the available mining engineers between these two needs.

The service branches need strengthening and modernizing and in some places should have a bigger role. "Bottlenecking" is often the obstacle to efficient control. The mechanical and electrical engineering services need reinforcement, and civil engineering, now weak, needs to be built up. These engineers must also be given proper status in the industry and allowed to function properly as services, if engineering standards are to be raised.

So too the small but important branch of coal preparation engineering needs building up. The techniques of coal cleaning are now so highly developed that they demand specialization and the function of this Branch is to exercise technical control of cleaning plants, to plan extensions and to be responsible for the quality and grading of finished products. It bridges the gap between Production and Marketing.

Specialists devoted to individual subjects, mainly in mining itself, are also of great importance. They are needed for such things as ventilation, the use of explosives, roof control, mechanization in various forms, and so on, or, in the case of safety experts, to concentrate on a particular aspect of all mining operations. Mining is far too big a subject to-day for any one man to remain in detailed touch with all its branches. Specialists are needed within the service branches too: mechanical and electrical engineers dealing with particular sides of those ever-widening subjects.

### THE INSTRUMENTS OF MANAGEMENT

It is not sufficient, however, to develop a composite form of technical organization broad enough and attuned to the complications of modern times: management must also have modern tools for control, for analysing work done or to be done, and for finding means for improving efficiency.

The mining industry has been bedevilled with statistics; and yet its management has been lamentably short of effective means of measuring efficiency and of getting essential information in concise digestible form. Records should be designed to expose simply those facts of primary interest, and to facilitate comparisons between the expected and the actual. In this, mining must learn to devise simple means of seeing quickly the variations from pre-planned standards.

We not only need simpler records; their content needs to be more precise. In collieries more than anywhere we need facts, not opinions. There is here an important field for the application of work study, whose techniques, designed by objective scrutiny of operations to produce measured facts, are having notable successes in other industries.

No doubt application of work study raises more difficult and complex problems in mining operations than in repetitive work in a factory; mining is inherently far less susceptible to any form of standardization and offers much less uniformity than most manufacturing processes. Moreover, it has to be admitted that technical efficiency in mining is so largely dependent upon good planning that work study may simply reveal defects in planning and that this is difficult to correct. But, despite all these obstacles and difficulties, if we are to "improve production" I am convinced that we must take up the challenge presented to us by the success of these methods in other fields.

Indeed, although it may well be more difficult to introduce these methods in coal-mining than elsewhere, coal-mining needs them perhaps more than any other industry. We need them not only for direct purposes of analysis and to seek to improve efficiency but also for the inter-related purpose of comparing the results of our different production units. Just because physical conditions in mining vary, and straight comparison of costs and productivity is thus invalidated, the higher levels of management need common basic standards, a common scale, and a common terminology, in order to assess the quality and standard of control at the collieries.

## SAFETY

I do not propose to touch on this as a separate subject today. So important is it that it justifies a session to itself, for it runs through the whole gamut of mining. I would only remark that improved safety goes hand in hand with increased efficiency. The more efficient our management, the safer will our collieries be.

## MAN-POWER AND LABOUR RELATIONSHIPS

I have left this to the end, but the men in the industry and relations with them still combine to form the most important single factor in our success or failure to "improve production." With improved technical management, reconstruction and new methods at the coal face we shall depend in the end upon the men in the pits.

As to numbers, we shall, of course, need fewer as efficiency improves, but this does not mean that an adequate number of men in the mines is assured. Recruitment of boys over the last year has been good, but we cannot live in the stop press news; the age pattern in the industry is still unbalanced and in some coalfields there is little hope of obtaining locally the young men the pits will need. To secure them there must be careful planning of recruitment and the provision of houses in the areas where the demand is strongest or will increase. This has been recognized and the Board has its own building programme.

The vital need to recruit young men and boys into the industry will persist.

More important than numbers are human relationships. This is a subject worth a whole symposium and impossible of compression into a few passages. It is really the most important issue of all, without which the material reconstruction of the industry will fail.

## CONCLUSIONS

I have tried in this paper to identify the cardinal factors which are needed if we are to "improve coal production" to the extent which the economic situation of the country will demand. They can perhaps be crystallized thus.

The industry must be developed to an overall National Plan. It must accelerate the reconstruction programme which implements the Plan, increasing the drive and resisting the temptation to concentrate on immediate production at the expense of a disproportionate future loss. Simultaneously there is much to be done in immediate or in short-term improvements.

The latest methods and techniques for the coal face must be developed and new ones discovered, since overall productivity will inescapably be governed to a large degree by what can be done at the face.

To carry out these tasks the industry must have a modern organization for its technical control, one capable of meeting the complicated needs of the age, and making it possible for individuals to carry out effectively the tasks allotted to them. Mine management must make use of the latest instruments of control which are being found effective in other industries, designed to turn a searchlight on operations and organization.

Above all, "to improve coal production," management and men must pull together, in a new and corporate undertaking, where each understands the place of the other, and his own share in the partnership.

I said that to attempt in this way to enumerate the needs of the mining industry would mean focusing attention on our weaknesses. In so doing we run into the danger of seeing all the black side. Perhaps many other industries, if dissected and put under a microscope, would reveal serious deficiencies.

Coal-mining has a great tradition of engineering skill, hard work and real endeavour. I need not remind this ancient and distinguished Society how often in our engineering history technological developments have originated in the collieries. Today as our needs are greater, so are the opportunities greater. If we tackle the problems of the twentieth century in the spirit of the pioneers, of Abraham Darby, George Stephenson and Humphrey Davey, we shall not fail.

## DISCUSSION

THE CHAIRMAN: After hearing this lecture, in which Mr. Browne has frankly stated that he had directed attention to the weaknesses of the coal-mining industry in this country, and after reading the reports in the Press of the conference held in Cardiff last Sunday of 2,000 National Coal Board and colliery representatives, it must be quite clear to all of you that all is not well with the coal-mining industry to-day. As Mr. Browne said, "improved results must be obtained in the future". Obviously the position is most serious and critical, and it concerns everyone, not only those actually engaged in the industry, but consumers, housewives, and all who use coal in any shape or form, and the numerous products which depend on coal.

When I asked a mining engineer friend of mine who has been in close touch with coal-mining all his life, what he thought of the present situation, he replied, "The main trouble is the complete apathy and lack of push and go, right from the top to the bottom of the industry to-day. There is only one place to get coal", he said,

"and that is in the pit. No amount of meetings and talks will get the same results; at all events, that is what I always found out."

My brother often said that knowledge, understanding and sympathy were all essential to true progress in the industry, and he was insistent that scientific knowledge and training are not by themselves sufficient in industry, since in general science concerns itself with matter rather than human beings. In order to achieve the greatest measure of success, men in industry must know how to handle men, how to pull together with a maximum of result and a minimum of friction.

Mr. Browne has mentioned open-cast coal, and as we had a very interesting lecture here in this hall not long ago by the Chairman of the National Farmers' Union, it might interest him to know that there were some very outspoken remarks made about open-cast coal-mines, and the disadvantages they were causing the farmers by depriving them of a lot of their best agricultural land. When I read that it would soon come to an end, between 1961 and 1965, I felt somewhat relieved, until Mr. Browne mentioned later on that it is considered that open-cast mining may still be able to help at that time. I am afraid the farmers concerned will not be pleased to hear that.

I was interested to hear what the lecturer said about the mining of coal at the coal face and the use of mechanical coal cutters, conveyors, etc., and it was pleasing to note his comment that the improvement in the *quality* of the equipment has been great in recent years. Is there not a pressing need for improvement in the *number* of these mechanical aids to production to be installed in the mines to improve their efficiency and reduce the costs?

MR. THOMAS CONVEY: The paper has been concerned with improvement of production. I should like to ask a question as to what is being done to improve the lot of the common producer in the mining industry, that is to say, the man at the coal face.

MR. TOM BROWN, M.P.: I should like to ask the lecturer, in either the short-term planning or the long-term planning, whether regard is being paid to the bottlenecks that he referred to in his paper. As he well knows, there are a number of shafts in Lancashire where, with all the will in the world, improvement of the coal face room and intensified mechanization, the shafts are so narrow that you cannot wind the coal that the coal face worker produces. Therefore, there is a bottleneck there.

Has any regard been paid to improvement of shaft apparatus and the shafts themselves to deal with the volume of coal that intense mechanization of the coal faces will produce?

MR. L. LANDON GOODMAN: I should be very interested to know the method of the introduction of mechanical equipment to the pits and collieries, for example, the exact psychological method of introducing the proposed equipment to the operators.

I was interested by the speaker's reference to "work study". I should like an explanation of what he means by that. Does he mean, as commonly used in industry, time and motion study, or does he mean method study and work measurement? I should like to extend the implications of this term and say what is needed is production research carried out by engineers. The engineer will, of course, bring in a motion study man when necessary. The problem is one of engineering, as the speaker has said, and very definitely production engineering, so there is a need, as I see it, for production research.

MR. K. D. WOOLLEY: Mr. Browne left to the last the important subject of labour relations and management control. Major Cadman referred to "apathy" in the industry. These two matters are obviously related, and I should like to know, first, whether Mr. Browne recognizes that "apathy does exist from top to bottom in the

industry", and if so, whether, secondly, that particular subject is receiving any special consideration by the Board.

MR. GEORGE MCROBIE: I have two questions, one on production and one on utilization.

Whose responsibility does Mr. Browne envisage it to be, to temper demand to the possibilities of production with regard to costs?

Secondly, is it known what proportion of the total output now is combustible but unsaleable, that is, in the form of slurry and very small coal? And what steps are being taken by the Board to make it combustible and saleable?

MISS BERHENS: I should like to ask where open-cast coal is mined now. I saw some at Newcastle.

MR. THOMAS CONVEY: Have the Board developed any rapid means of drilling shafts by means of circular coal cutters?

THE LECTURER: I think that out of your own remarks, Mr. Chairman, one specific question emerged: is there a need for a greater quantity of coal-cutters and conveyors in the pits to-day? The answer is emphatically no. The quantity of coal face machinery is now sufficient and the quality is generally high. The numbers of coal-cutters and conveyors which I have quoted purchased in the last seven years represent a substantial proportion of the total numbers of these machines in regular use. The need is, rather, to develop new types of power loading machines capable of working under our variable conditions.

The sinking of shafts by rotary drilling has not been employed in this country, though it has been used on the Continent, because the rocks through which we sink here are normally harder, and these processes have only been used for soft minerals such as chalk; but it may be that when a fifth colliery is sunk in Kent there will be a large thickness of chalk to be met, and rotary drilling might be employed. I do not think that this method is likely to find an application elsewhere owing to the variation and hardness of our strata. On the other hand, rotary drilling is not the only possible means of improving shaft-sinking methods.

The question as to what has been done to improve the lot of the miners is a big one, which cannot be dealt with in a few words. But the questioner will no doubt have observed the movement of miners' wages from a very low place in the list to the top—a position which I for one think they should hold. That is one aspect of the improved lot of the miner. Secondly, though I have no details with me to-day, there are greatly increased welfare facilities. Thirdly, I think it can be said with justice that, although the working conditions of many collieries at the Vesting Date were good, at others they have been appreciably improved.

My old friend, sometimes my adversary, Mr. T. J. Brown, M.P., referred to bottlenecks. This is a very relevant question, because the mining industry suffers acutely from lack of capacity in one form or another. The basic form of capacity is faceroom—mining development—but Mr. Brown correctly refers to one of the important links in the chain from the face to the railway wagon, shaft winding. I can assure him that the reconstruction programme makes ample provision for winding capacity.

Mr. Goodman's first question related to the "psychological method" of the introduction of machinery, and I think the inference was whether sufficient care was being taken over the psychological aspects of new mechanization in mining. I should not like to claim perfection, but I would say that the Board is extremely conscious of the need to secure the confidence and co-operation of the men who are going to operate new machines, and that the method of approach and proper explanation are most important.

By "work study" I meant to comprehend all that Mr. Goodman has in mind, not merely time study or any of the other instruments used in it. The terminology of these techniques is varied, but I meant the whole study of methods and operation, the primary purpose being to turn a highlight on our technical management.

Mr. Woolley referred, as the Chairman did, to "apathy" in the mining industry. I think it would be an injustice if I did not say that there are many, from top to bottom—I will not say all—who are giving everything which they can give to the industry.

Mr. McRobie asked about the coal preparation programme, and the proportion of unsaleable coal produced to-day. There is very little unsaleable coal: perhaps you may say that this is a pity! But the reconstruction programme includes a great deal of coal-cleaning plant, and this is one of the branches in which we have already made good progress with the erection of new equipment. It is, in fact, a little ironic that the improved cleaning of the coal affects adversely our published figures of production, since the proportion of saleable coal out of the total goes down each year. We are removing more and more dirt from the coal and this makes our production on paper look proportionately worse.

Open-cast coal is got in several parts of the country. Happily it is not one of my responsibilities and I cannot claim to be an expert about it. My reference in the paper was in relation to a possible demand of 260 million tons per annum in ten years' time. It is thought that open-cast will be continued for longer than was first anticipated, and although we may all dislike the effects of it, as long as the country is short of coal, I feel that such a policy would be regarded as right.

*A vote of thanks to the lecturer was proposed by the Chairman and carried with acclamation; and, another having been accorded the Chairman, the meeting ended.*

## GENERAL NOTES

### OPENING OF THE MUSEUM OF LEATHERCRAFT

The Museum of Leathercraft, which opened last month, was born in 1946, the offspring of the Education Committee of the National Leather Goods and Saddlery Manufacturers' Association out of the enthusiasm of two individuals, Dr. C. H. Spiers (now Honorary Keeper) and Mr. John Waterer, R.D.I. (now Honorary Secretary). Handed over, in 1951, to a body of independent Trustees, it was placed on a wider basis. The first act of the Trustees was to take steps towards incorporation as a non-profit-making, limited liability company: the second to organize an exhibition, "Leathercraft Through the Ages", as an adjunct to the Festival of Britain. Since then the work of seeking financial support, of building up the collection, and of searching for a suitable home, has gone quietly ahead, and on May 20 Sir Cecil Weir, K.B.E., M.C., declared open the first modest home of the Museum—a room lent by the Governors of the National Leathersellers' College, Tower Bridge Road, London, S.E.1. Here is now displayed part of the collection, arranged in the form of a much condensed survey of the use of leather from pre-history to about 1900.

The story commences with a small collection of flint implements, the earliest being some of the disputed "eoliths" (perhaps before 500,000 B.C.) of Benjamin Harrison, followed by authentic tools from Swanscombe and elsewhere (from Lower Paleolithic to Neolithic) thought to have been used in the preparation of animal skins for use. There are interesting reconstructions of a skin bowl (with a genuine "pot-boiler"—a calcined stone cracked in all directions by sudden contraction when used for heating water), a bolas for tripping animals, and Iron Age bellows. The earliest actual examples of leather are a small bowl believed to be Neolithic (loaned by the Cuming

Museum, at present closed), and Roman footwear exhumed in London: a large leather-covered shield is based on the Anglo-Saxon remains from Sutton Hoo, and Abbott Aelfric is quoted as evidence for a wide range of leather objects in regular use around A.D. 1000. The display is perhaps richest in its Medieval section which contains some superb examples of *cuir bouilli* (moulded leather) containers including bottles and blackjacks, leather-covered caskets, forcers and boxes, a pair of water-budgets (conjectural reconstruction) and exhumed footwear.

The sixteenth and seventeenth century sections include a splendid pair of Elizabethan gloves embroidered in silver-gilt, a fine buff doublet, coffers with beautiful nailed patterns, one of which belonged to Queen Catherine of Braganza, decorated mural panels, upholstered chairs, flasks and bottles and fire-buckets. The elegance of the eighteenth century is reflected in much of its leathercraft which also played an important part in industrial development. The collection is enriched by the Edmondson collection of blackjacks and leather bottles (types in regular use for at least six centuries), for many years on view at the V. & A. Museum.

The gallery, though small, is elegant and colourful, the exhibits tastefully arranged with excellent hand-written descriptive labels, and the organizers are to be congratulated on their approach to this important aspect, too often unconsidered. For the present the Museum will be open Mondays to Fridays from 2.30 to 5 p.m., when the College is in session and at other times by arrangement with the Hon. Keeper. Admission is free.

## *CORRESPONDENCE*

### FUNERAL EFFIGIES IN NIGERIA

*From* WILLIAM FAGG, ASSISTANT KEEPER, DEPARTMENT OF ETHNOGRAPHY, BRITISH MUSEUM, LONDON, W.C.1

I have read with deep interest the text of Mr. Howgrave-Graham's lecture in the Coronation issue of the *Journal*, not only for its intrinsic excitements but also for its bearing upon one of the most interesting problems of African Negro sculpture —a problem to which I made some reference in a lecture which I had the honour of delivering to the Society and which was published in the *Journal* for 27th July, 1951. I mean the mysterious occurrence of what appears to be portraiture in bronze and terra-cotta sculpture of (we think) about the thirteenth century at Ife in Nigeria, in the midst of the innumerable woodcarving styles for which African art is famous and which are with few exceptions conceptual and symbolic rather than mimetic in purpose and character.

I do not wish here to say more about Ife art itself, on which (in spite of the Nigerian Government excavations in which I was privileged to assist earlier this year) there is still wide room for speculation. But one of the surviving ancient customs of Southern Nigeria which we have tentatively connected with the Ife problem is that of the "second burial", more particularly in the form in which it is practised at Owo, a town some 60 miles north of Benin and 72 east of Ife. A brief outline—based on information collected by Mr. Kenneth Murray, Surveyor of Antiquities, Nigeria, and myself in 1950—will serve to bring out some remarkable parallels with the account of the British funeral effigies.

When an important person (such as a chief or chief's mother) dies at Owo, his corpse is buried after a few days with such ceremony as can be arranged at short notice. A skilled carver is engaged to make a life-size and life-like image (called *ako*) of the deceased, but it is not clear whether this is done from memory or by using

the corpse, before burial, as a model; it seems certain that no death mask is made (though photographs are now beginning to be used). After an interval varying from a few weeks to two or three years, according to the time taken to amass the necessary wealth (as in the case of Anne of Bohemia), the family organizes the "second burial", at which the image, dressed in full finery, is ceremonially buried with much drumming and dancing, a great deal of firing of guns and a costly fireworks display—the whole apparently intended to ensure the highest possible status for the deceased in the next world. In the case of the mother of the present Olowo (King) of Owo, two images were made, the first, considered an unsatisfactory likeness, now lies in a store-room in the palace, while the second, by the carver Ogunleye, was duly buried. The image of the mother of Chief Sheshere, also by Ogunleye, was not buried at the second funeral, but brought home and kept, with periodical ceremony, in a locked upstairs room of the Chief's house, where we were able to examine it; the Chief said that his children would die if they were to set eyes on it. This carving, like that in the Olowo's palace, was articulated, and the parts to be covered by the dress were but rudely carved (as with most of the Abbey figures); the head, however, was a "speaking likeness" (as we verified by comparison with a photograph of the lady seated in ceremonial dress during life), except that the ears were somewhat stylized. I believe that this effigy had human hair.

Of the similarities between the effigies at the Abbey and at Owo, the most interesting is perhaps the occurrence in both of the desire to make them as realistic as possible, at a time and place in which some degree of stylization was for other purposes the order of the day. I will follow Mr. Howgrave-Graham's excellent example in abstaining from rash speculation about the origins of these customs, but they are interesting enough to deserve a good deal more comparative study in various parts of the world. Perhaps finally it may be worth mentioning the neolithic skulls, with naturalistic features modelled in plaster apparently by way of portraiture, which Miss K. M. Kenyon excavated recently at Jericho—and which in their turn are closely comparable with the modelled and painted skulls still made by the Sepik River tribes of the Trust Territory of New Guinea.

## *FROM THE JOURNAL OF 1853*

VOLUME I. *1st July*, 1853

*From* Miscellanea

SEWING BY MACHINERY.—A machine, of American invention, has been introduced into this country by Mr. Darling, of Glasgow (at whose manufactory numerous examples of it are now in operation), which carries the mechanical principle into a fresh department of human labour—namely, that of common hand-sewing. The machine is extremely simple in construction. Its framework is of cast-metal, and it occupies little more space than two cubic feet. The right hand of the worker turns a small wheel, which puts in operation two needles,—one an upright needle, the other a sort of semi-circular one; and on a strong tabular surface, at the left-hand extremity of which these two needles work—the upright above and the circular under—the cloth is laid with the left hand, and propelled between the needles as the machine proceeds with its stitching. It is said that the machinery is not liable to become deranged, and that any breakage of the thread can be rectified with very little loss of time. The machine can be driven by the foot, after the manner of a turning-lathe, and in this way the rate of work by hand, which is 500 stitches per minute, would be doubled.